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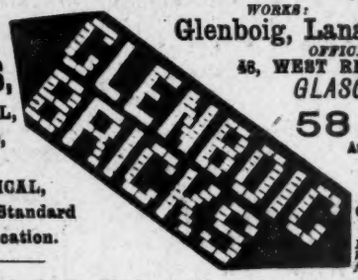

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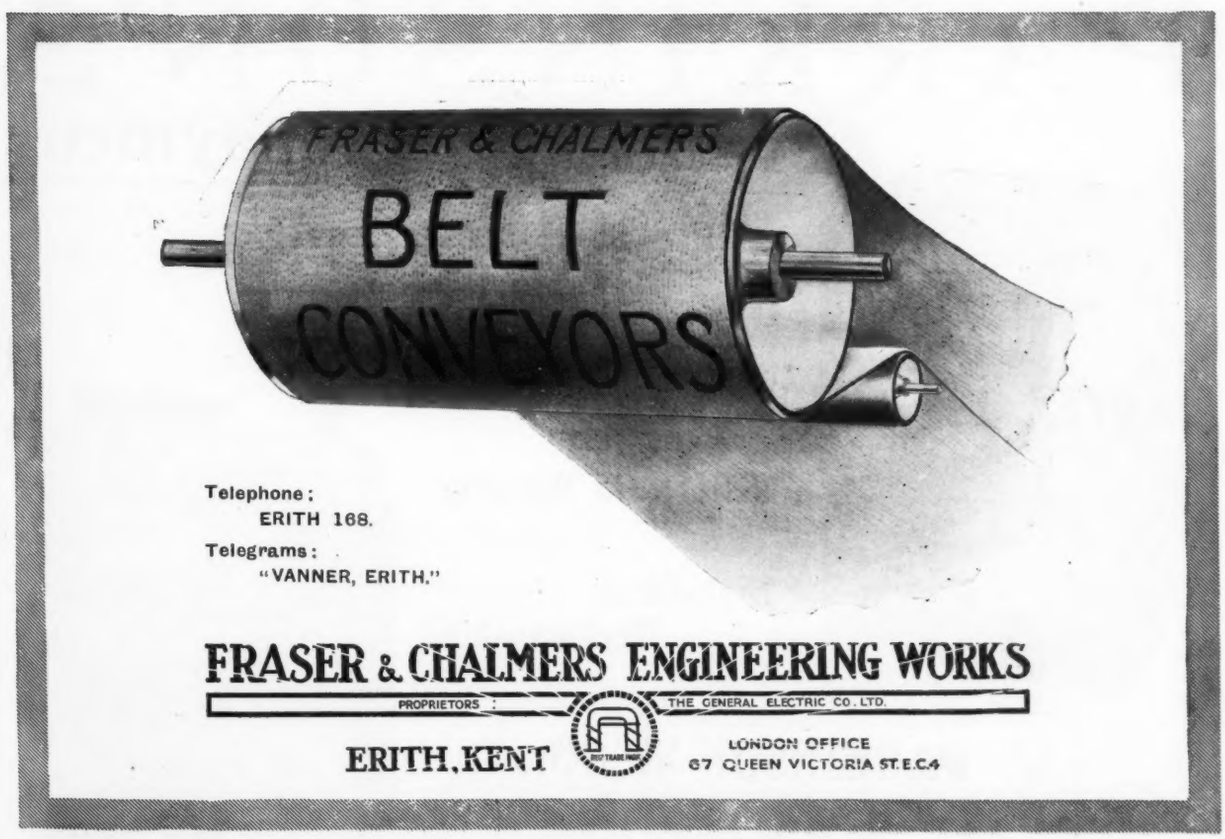

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EDITORIAL NOTES.

Compulsory Greater Gas Make per Ton.

COINCIDENT with the beginning of the railway strike on Friday night, the President of the Board of Trade (Sir Auckland Geddes) and the Coal Controller (Sir Evan D. Jones) issued a series of Notices and Orders referring to the production of gas and the use of coal, gas, and electricity, with the view of making available stocks of coal go as far as possible. Under one Order statutory gas undertakings are prohibited from using in the production of gas a greater quantity of coal than will suffice to produce gas of a quality 15 p.ct. lower than the quality prescribed by any Special Act or Order for the time being applying to the undertakings, and no other gas undertakings must use in the production of gas a greater amount of coal than will suffice to produce gas of a calorific value not exceeding 425 B.Th.U. gross. Lower pressures than the minimum prescribed are also authorized at periods of the day that are off maximum load; but the consumers are to be informed by newspaper advertisement or placard of the periods at which there will be reduced pressure.

The first part of the prohibition as to quality is not very specific, seeing that Special Acts and Provisional Orders variously prescribe illuminating power and calorific power; and the illuminating power standards range from anything between 14 and 16 candles. But inasmuch as before the war a calorific standard of 500 B.Th.U. gross was being prescribed in Special Acts, and a 15 p.ct. compulsory reduction is mentioned, and 425 B.Th.U. is prescribed for other than statutory undertakings, it is very obvious that, in the present emergency, with the view to making coal spin-out as far as possible, 425 B.Th.U. is the figure to which it is intended gas undertakings shall work. [Since writing, we learn that this is the official interpretation.] How gas undertakings that depend solely on coal, and are not equipped with water-gas plants or steaming arrangements, are to slip-down to 425 B.Th.U. without some heavy dilution with inerts is not clear. If, for instance, the South Metropolitan Gas Company attempt to comply with the Order, their gas will have seriously to depart from the 12 p.ct. maximum of inerts to which they now work. However, whether practical or not, "infringements of the Order are "summary offences against the Defence of the Realm "Regulations." It is a new thing for a gas undertaking to be threatened with a penalty for supplying in excess of a prescribed quality. But new circumstances have arisen; and these circumstances are likely to be repeated in view of trade union developments. Fortunate are those gas undertakings with water-gas plants; and imprudent will be those who have not such plants, and do not get them at the earliest possible opportunity.

Certain outside uses of gas for lighting (other than public purposes) are prohibited; and it is made a personal duty to cut-down the use of coal, gas, and electricity at every possible point, and to the greatest possible degree. Where there is waste or abuse, the Local Fuel Overseer may order the supplies to be disconnected; and other unpleasant consequences may follow.

It is sincerely hoped the strike will not be long, but that it will not be brought to an end by the retreat of the Government from the firm stand they have taken. The main thing is to make stocks of coal go as far as may be now, by getting from it as many cubic feet as is practicable of 425 B.Th.U. value. At the same time, the regret will be great at having to make inroads into those comparatively small and hard-won coal reserves that were destined for the colder and still shorter days. But one cannot do more than is humanly possible in such circumstances as those existing at the present time.

The Railway Strike and Trade Union Tyranny.

THE country is now being put to a severe test; and it is the duty of every citizen to give the Government in this great crisis all the material and moral support that is possible. It is now absolutely clear that certain of the leaders of the more powerful of the trade unions have launched out upon a policy of sheer tyranny, intimidation, and dictation. Their decisions are to be law. There is no community and no Government to be considered if there is not at once compliance with their will; and there is to be no sufficient discussion as to whether their proposals are sound. Nothing but speedy compliance will suit these despotic potentates. This sort of thing cannot be. No nation can prosper if subjected to such sectional rule; and so we are face to face with a condition of affairs to-day in which the nation as a whole must stiffen its back and suffer hardships and inconveniences rather than submit to such tyranny, and the violation of the rights of every citizen. We know how hard and painful it may be; but once give way to bullying of this sort, and the country will find itself well on the highway to ruin. Some people are persuaded that it is already there, and largely through the action of the trade unions.

Grave beyond measure is the railway strike which started at midnight last Friday, on the decision of the Executive of the National Union of Railwaymen, and which in a few hours put the whole country into a state of turmoil. And this catastrophe over a question of standardizing the rates of pay of certain now very well-paid grades of railwaymen, though a settlement had already been arrived at with the drivers, firemen, and cleaners! A significant aspect of this vile business is that there was an agreement which safeguarded the wages of all classes of men until Dec. 31; so that there were three months available for discussing any differences of opinion that existed with respect to the grades concerned. A proposal had been submitted by the Government; but because it was not at once in accord with the demand, the Executive of the Union determined to hustle the Government into compliance. That the Government (although knowing what non-compliance meant) could not comply in the interests of the country, with a railway wage bill in existence of 65 millions in excess of the pre-war 47 millions, demonstrates that the position was one in which demand was altogether beyond reason.

The question has been put: "How is it possible for any "Minister to hold the balance fairly and justly between the "claims of the workers on the one side, and the reasonable "requirements of the community on the other, if, as soon "as he ventures to reach a decision which is distasteful to "the Executive of the National Union of Railwaymen, he "is threatened with a national strike?" The question is admittedly a difficult one. Nevertheless, the balance must be held fairly and justly in the interests of sound government and of the nation. Government must vindicate itself by justice and strength; otherwise we must confess at once that the nation as a nation is incapable of government. It seems to us, looking quite dispassionately at the position—at the concessions already made, and the time available for discussion without any infringement of the rights and the gains of the railwaymen—that the leaders would have a strike. The "ultimatum" and (before conference, mind) the

lightning notices to branches of the Union prove it. Was there any hidden motive for this? Was the standardization question merely a disguise? If other motive there was, the only one we can find is that it was to show the power of the unions to hold-up the entire country, and to make an impression that should influence the concession of nationalization, whether or not the country is willing. But it has had another effect. It has revealed the dangers of nationalization. The Government have the railways under their control to-day; and the large unions appear to have less respect for the Government than they have for private enterprise. What of Mr. Justice Sankey's pious belief that men will work better for the nation than for private employers? Nationalization! We know now that the ultimate aim is not bureaucratic management of the public services and industries that the unions are asking shall be nationalized, but "management" by the unions themselves. They want to bear none of the risks as private enterprise has to do; but they are out to screw from the public services and the industries every bit of advantage possible for the members of the unions, without any regard to the national interests. Consummation of this policy means ruin. If the employers acted towards the employees as these unions, or their representatives, are acting towards the employers and the country, what an outcry there would be over the dastardly action! Enough for the moment. It is now set teeth and stiff backs throughout the country.

In the strike of foundrymen and coremakers there is another illustration of bad faith. They demanded an increase of 15s. a week for the men and 7s. 6d. for the apprentices. But here again the employers were already under a legal obligation to pay until Dec. 1 rates of wages in accordance with an award made in July. Not until next month (October) was the time ripe for the unions to give notice of any revision that they desired; and then the matter should have received consideration in the legitimate way. But last Monday found the men on strike over their premature demand; and the whole of the engineering business was at once seriously imperilled, together with the mass of workers who have no part in the demands of founders and coremakers. Stocks of castings in the country are meagre. The whole of the engineering industry is thus threatened with paralysis through an act disgraceful in its opportunism and disloyalty to agreement. Such action has to be combatted. This process of wage extraction may be temporarily very nice for the participants; but it is the sure way of bringing the country to poverty and not prosperity. The poverty will be more powerful than the trade unions. In it members of the unions will have to share in company with other people. They will be simply reaping what they have so diligently and callously sown.

The Beilby Report and the South Metropolitan Proposals.

THE results of the examination of the Beilby report which an "Engineer" made in our last issue are not likely to find many critics, because in the main they are quite in accord with the views of most other men who have given to the report intelligent and impartial consideration. Those who have misinterpreted the meaning cannot have made of the document the careful study which is its due, as being (so to speak) the pivot, with certain structural details modified, on which the industry will have to turn from old and obsolete conditions to new. Gas men who have not made careful investigation of the report, and so absorbed its full import, have not realized the responsibility that is on them. There are, we hope and believe, few who have done their duty in this regard who have concluded that there are in it any hard-and-fast lines drawn as to the thermal value of the gas which they may elect to supply under their individual conditions, subject to an approximate uniformity of the gas when once selection is made until release is granted on a case being presented to the Board of Trade for change, and subject further to the consumers' appliances being adjusted to the thermal condition selected and authorized. Thus it is that very few gas men (so far as we are aware) seriously object to the South Metropolitan Gas Company electing to supply 550 B.Th.U. gas. They can do this without establishing any precedent in an Act of Parliament; and if hereafter they find that conditions so alter that it will be preferable in the interests of their business to reduce the figure, the liberty will be theirs to make application to the Board of Trade to do so.

The calorific power, or the degree of heat energy, selected not being something settled for all time, and not having the prescription in an Act of Parliament which would require another Act to modify it, is an altogether different matter from a settled prescription of low limits of inerts and sulphur compounds in an Act. The difference is very obvious. "Engineer" himself admits that the Company's acceptance of the recommendations of the Board of Fuel Research in these respects would be a retrogression; and we have not heard one single man in the gas industry excepting those who are associated with the Company who says otherwise. Let there be no mistake about our attitude in the matter. There is not the slightest animosity on our part towards the South Metropolitan Company. The industry is under a considerable debt of gratitude to the Company, and to Dr. Carpenter its head. But there is here a question of policy which affects the whole industry; and it is a question of policy that is of vital importance to the industry in its every part—whether the part be large or small. It will be remembered that the Company have "accepted" the report of the Board of Fuel Research "in its entirety," and such acceptance has only one meaning. It means—the date of the announcement shows it—that the Directors will promote a Bill in Parliament accepting the original report without modification—including the limitations of inerts and sulphur compounds, minimum pressure, and all that is proposed. In fact, in their last report, the Directors stated that they intend "in due course to ask the assent of the proprietors to "the promotion of a Bill embodying the recommendations "made." Not all gas companies could work to the super-refinements proposed by the South Metropolitan Company; and there is plenty of evidence available which shows that such refinements are not necessary, and that they would be restrictive to progress in economical gas production, under the existing conditions of most gas undertakings.

The "retrogression" is admitted by "Engineer;" and he searches for a way of escape from the injury that would be done to the industry by creating new restrictive precedents in an Act of Parliament. He apparently would like the South Metropolitan Company to gratify their fancy for having restrictions put upon them in an Act (which is repugnant to the old traditions of the concern), while he does not wish any injury to come to the industry by the creation of the precedents. The only mode he can find of satisfying this dual desire is expressed as follows: "It may be that no "harm will be done to the cause of the industry in general "if the South Metropolitan Company were to make it clear "to the parties concerned (local authorities and others) that, "although in the happy position of being able to conform "themselves, they do not wish their acquiescence to be "taken as a precedent." How would they be able to make it clear to the authorities? And how much notice would the authorities take of the information? The precedent would be there, cast in an Act of Parliament, and handy as a ground of contention for all who cared to use it. The temptation to utilize it would be irresistibe for local authorities and members of the Parliamentary Bar. If the South Metropolitan Company create such a precedent, no matter what pious hopes are expressed of their desire that it should not be so regarded, use would be made of it all the same. If not, then local authorities have undergone a marvellous change. The best and safest plan is not to create a fresh restrictive precedent if it can be avoided. If the gas industry gets the Board of Fuel Research to modify their views on objectionable points, it would be just as easy for the South Metropolitan Company not to go outside the modification in their Bill, and then in their daily practice to work to any degree of refinement they like. They could just as well so work then as they can do now. If they persist in creating a precedent by prescription in an Act of the limits suggested in the original report of the Board of Fuel Research in respect of the matters in view, they will not be doing anything that will improve their own position, but will, we are confident, be bringing upon the rest of the industry something that will occasion infinite harm, anxiety, and discussion when Bills are promoted. We cannot think the Directors of the Company desire this. Their action will prove whether they do so or not.

"Engineer" is thoroughly in favour of the proposed method of doing business on the thermal unit basis; and of charging, as well as basing dividends, upon it. He prefers that the conversion of the industry in this respect should be complete. We agree with him, as it will be a good thing when the gas industry comes to be still more widely and

popularly realized as suppliers of heat energy. There is no more reason why the public should not get to know as much about B.Th.U. as, and even more than, they have done about cubic feet. Cubic feet is only a measure; it has no relation to use. The term B.Th.U. has. It is a new freedom—a new basis on which to work and do business—that is offered to the industry; and it will be foolish if it does not take full advantage of the offer. This is not only a sustained but an increased belief as time advances from the date at which the Board of Fuel Research issued their report. "Engineer" discusses with an eye to practical results the basis of charging for B.Th.U.; and from his study of the matter he is of opinion that the difficulties which may be present in the minds of some few gas men will disappear as they come to closer grip with the problems. A number of principles are laid down in the article which should be followed in constructing a basis of charge; and here, as in other parts, there is little, if anything, to criticize. There is objection by the writer of the article to the 3420 B.Th.U. of the electrical unit being taken as the basis of charge, on the ground that the increment or decrement of the unit-charge would be altogether too small for practical purposes. At the same time, we want to adopt some plan that will enable the user to compare the potential heat energy of gas and its cost with that of electricity. It might be sufficient to print plainly on the accounts how many electrical units are the equivalent of the gas unit adopted.

This matter of the selection of the gas unit is very important. Whatever it is, it will stick to the industry the same as "1000 c.ft." has done; and since the industry has had to compete with the small unit of the electrical industry, it has, so far as the general public is concerned, found some disadvantage in the large charge-unit of 1000 c.ft. There was nothing to show the relation in respect of heat value of the old 2s. 6d. or 3s. per 1000 c.ft. and the 1d. or 1½d. per unit of electricity for heating. It is worse now we have got up to 4s. to 5s. per 1000 c.ft.; and the electricity industry is for heating at 2d., 2½d., or 3d. per unit. We can alter this now; and while changes are being made, let us be thorough. If the heat value of the electrical unit is too small to be of utility to the gas industry, a gas unit must be selected that will not be. "Engineer" suggests 100,000 B.Th.U. It is the same one that Dr. Carpenter proposed in the first instance, and told the proprietors of the South Metropolitan Company that it was the one the Directors intended putting in the Bill. It is far removed from the 3420 B.Th.U. of the electricity industry; but it is clear that a figure must be adopted that can be practically applied. "Engineer" presents the case for its adoption; and those who have read his article are at liberty to offer any criticisms they may have to make on the case, as well as on his proposal as to dividends also being on the heat unit basis. He is not in favour of any half-way house, but holds that the industry should devise means for acting in every particular up to the spirit of the report of the Board of Fuel Research. Do not let us adopt a *non possumus* attitude, with a scheme before us for giving the industry a more extensive life through larger technical and commercial freedom.

Newspaper Agitation over Gas Charges.

A NEWSPAPER agitation has started over gas prices; and we are glad to see it. More of it, and still keener, would be preferable, as this would help to enlighten the public—and the authorities. The latter might then be brought to their proper bearings, and instead of increasing control over the industry's operations, and piling-on conditions which only add to costs, they might endeavour to ascertain how they could bring about a better condition of things. We can flatter ourselves upon gas being such a popular commodity and so necessary to labour-saving and fuel economy that the daily papers protest against the "soaring" prices for it, and the public support the protests. These show that the public do not understand the position correctly, nor do the editors of the daily newspapers. They are told in nicely-worded letters from gas companies that the increases are due to the heavy additional prices put upon coal, to the enhanced wages that have to be paid, and to the stupidity of the authorities in making many gas undertakings pay several shillings per ton more to convey coal by sea (and so benefit the shipowners at the expense of the public) when the gas undertakings could get what they want by rail at a cheaper rate. They are told, too, of the unkind fate that has come upon gas investors and their dividends through the operation of a sliding-scale the terms of which were moulded on pre-war terms, and the then ruling economic conditions. They read and they hear; but their faces disclose very fine scepticism. They find it difficult to believe that a great industry pursues a course of trading on principles that are without precedent, and so altogether opposed to the custom of the commercial world. We have got to teach them that this is true, and it is only fair the conditions should be altered, so that the capital employed in the gas service of the public receives a just dividend. We have also to teach them that the price of gas can only be reduced by bringing down the costs of production, which cannot be while restrictions continue and the prices of coal, materials, and labour are what they are. The public—including the great multitude of prepayment gas consumers, for whom we are truly sorry—must be satisfied that the industry is not profiteering, and that the charges that are being made are those that are necessitated by the service, and that they only permit of the people who have provided the capital employed (many of them small investors) having but a modicum of return upon the capital.

So we are glad the agitation has started. We hope it will go on, and increase in volume and vigour. It is badly wanted. The industry require the support of the public. Though the public may not yet realize it, the fact remains that the responsible men of the industry are on their side heart and soul, and are willing to fight with and for them. But nothing material can be done until something is accomplished in reducing the costs of coal and other material. The Gas Light and Coke Company and the South Metropolitan Company cannot help raising their charges for gas to 4s. 8d. The price of coal has gone up another 6s. per ton; and seaborne coal has been substituted in all southern undertakings that can receive supplies by water. The South Metropolitan Company, for example, carbonized in the twelve months ending June 30, 1,105,681 tons of coal. The 6s. per ton on this quantity means between £330,000 and £340,000. Some of this will be recoverable from the sale of coke; but the greater part will have to be paid by the gas consumers. The South Suburban Company have issued a notice that the price of gas will have to be raised owing to the 6s. per ton increase, and the transfer of the source of supply of coal, against the will of the Company, from the Midlands (whence it came by rail) to the North whence it is to come by sea, and so cost the gas consumers an extra 8s. per ton in carriage. This is a monstrous thing. It means a total additional cost of 14s. per ton. If this condition is insisted on, it would be necessary to put up the price of gas by about 1s. 6d. per 1000 c.ft. Naturally the consumers stand aghast at the thought of being charged 5s. 9d. for something for which before the war they paid less than 2s. 6d.

But the Directors have not yet determined the precise amount of the extra that will have to be charged; for the simple reason that they are not at present sure as to the amount of coal that will have to come by sea, and carry the additional 8s. carriage. There is good hope now that there will not be insistence upon the whole of the Company's supply being seaborne; and to the extent that there is relief in this respect, there will be a difference in the charge that will have to be made upon the gas consumers. To put the matter bluntly, this is a vicious piece of business. There is not a single part of the gas industry's operations through which by the actions of the powers that be both the gas consumers and the share and stock holders have not been made to suffer. The question of the increase in meter and stove rentals is also an unpleasant but unavoidable circumstance. There, again, materials and labour charges, costs of maintenance and renewal, and inspection, collection, and clerical expenses make the advance imperative. The gas undertakings have not caused these things; they are jointly with their consumers the victims.

This article, we hope, will be read by men not concerned in the administration of the industry; otherwise it would not have been necessary to touch upon the matter in these columns. Boards of Directors, we hear, are receiving from local authorities and consumers protests against the increases in the price of gas and in the rentals of meters and stoves. It is no use sending such protests to Boards of Directors. They should be forwarded to the Board of Trade; and the protest should be not against the price of gas, but against the costs of those things which are required in the manufacture of gas, and the conditions which divest the administrations of gas undertakings of freedom in managing their

business, as well as the continued unclean character of the coal that is supplied for gas making. We sincerely trust the agitation will continue, but be kept throughout in the right direction.

Small Undertakings and Concentration.

There have been many lessons for the gas industry during the war; and the greatest one of all has been, and is now, that the maximum possible economy and efficiency in every part of its operations, together with the extension of the foundations of the business of each undertaking, are essential to further progress. Higher costs and more onerous conditions have come to stay; and it is no use simply sitting still and looking at them, and thinking what undesirable companions they are. The industry has no ability to govern them; it can offer resistance to them, and, if this is effective, then the industry is fortunate. But it is not often so. We hope that something will happen that will reduce the prices of all the necessaries to the industry's well-being; but what will be the nature of that something and what its form, we have not the faintest notion. There may be a swing of the economic pendulum which will send prices lower than they are now; but, though not of pessimistic inclination, the exercise of intelligent examination does not give very much hope of any considerable decline, and certainly not to the levels of ante-war days. We have to apply ourselves to making the best of the position as it is; and any improvements in the position which are not the products of our own direct exertions will come into credit to the advantage of the concern, and for them there will be true thankfulness.

The smaller gas-works (say of 50 millions and under) have had their lessons as well as all other grades in magnitude up to the Gas Light and Coke Company. But the scope of these small ones for, by themselves, producing economies to set against high costs is of an almost negligible character. As the address is read of Mr. A. J. Bond, of Aberavon, to the Welsh Institution of Gas Engineers and Managers, their limitations are more intimately appreciated. Their managers are looking round upon current events and movements to see whether there is any hope of lightening, by credits from fresh economies and practices, the heavy debits that have during the last few years been set against their enterprise. There will be such credits; but the sum of them will not be in proportion to their sum for the larger works. To gain better returns from the economies of new practices, it would be necessary for the small undertaking to have a much larger business, because the larger and the more diverse the business, within suitable limits, the higher the level of the maximum economy that can be realized from (say) the new practices in carbonization, as well as in other obvious ways. Under similar local and capital conditions, the larger the operations, the cheaper should be the staple product; and this again is an important aid to the development of business and an even load. As Mr. Bond points out, the small gas-works are struggling with these heavy increased costs; and we have heard of some of the very small ones that have had to close-down, or are on the brink of such a catastrophe unless something can be done to produce relief. The position is worse still of those that are operating in an area supplied with electrical energy by a large power company. The small gas undertaking cannot in prevailing circumstances stand-up against such powerful competition in lighting and power, just as a small electricity undertaking cannot stand-up against the competition of a large gas undertaking. Providing there is nothing internally unfavourable, magnitude in existing conditions gives strength.

Then what does all this point to? To the small gas undertakings disappearing unless placed in a particularly favourable position, which many of them are not. It means that the time is fast coming (perhaps we ought to say, has already come) when their areas of supply should be linked-up to a larger undertaking, formed perhaps by the amalgamation of a group of small concerns, or by transfer to a neighbouring larger undertaking, or perhaps by the purchase of gas in bulk from a larger works. There are several ways of bringing this about. There must be consolidation and concentration of production under the most favourable conditions a district can offer. Otherwise the small undertaking must suffer complete dissolution through the new economic causes, and save nothing from it. It is seen in Mr. Bond's address that for some time past in his district, consideration has been given to the possibility of linking-up the mains of three or more works of small size, and laying down plant and machinery in one or more works sufficient to meet the requirements of the whole; and it is believed that very considerable economies can be so effected. The scheme has not yet matured. In all these schemes, however, there seems to be an unwillingness to bring them to a head. Life is sweet. The small gas undertaking would like to continue its independent existence, and struggles on. But hope grows fainter and fainter. The position does not improve; and the index-finger points unerringly to concentration of manufacture and consolidation of interests being the only ways to assure a future life. The larger operations are productive of economies which are barred from the smaller concerns standing independently.

Meetings Postponed.

On account of the railway strike, the National Gas Council had hurriedly to postpone meetings called for this week. The Eastern Counties Association meeting fixed for to-morrow (Wednesday) is deferred indefinitely.

Seaborne Coal and the Board of Trade.

As we are going to press, a message is received of interest to gas undertakings in the eastern, southern, and south-western districts, though not carrying much consolation at the moment. It is as follows: As a result of the representations made by the National Gas Council to Government Departments on the question of seaborne coal in place of railborne, they have now received an assurance from the Board of Trade that every endeavour is being made to provide for cases in which shipping arrangements are specially difficult. This intimation from the Board of Trade was received by the Council on Friday just before the railway strike commenced. It has brought to a temporary end all the kind offices of the Board; but still the information shows that, had things gone on normally, the representations of the Council were having effect. As a matter of fact, some specially hard-hit concerns were already having relief.

Summer Time Ended.

Summer time came to an end yesterday morning; and most inopportunely in view of the railway strike, and the need for coal, light, and heating economy. There will now be an hour's extra artificial lighting during the evening all over the country; and daylight will be well here the next week or two by the time most people leave their beds. So it is rather unfortunate in this respect that the railway strike synchronized with the end of summer time. Moreover, indoor life will become the thing for the dark evenings made monotonous by traffic destitution; and this may, unless there is very stringent economy, make an upward difference to the domestic consumption of both gas and electricity.

Suspect Somewhere.

London daily papers announced last week that the Profiteering Act Department of the Board of Trade was preparing a new schedule of articles not previously within the scope of the Act—including gas-meters and gas-stoves. If this is true, it will give someone an opportunity of putting to good test the question of alleged "profiteering" in these articles—a matter to which reference was made in our columns last week, and investigation into which the makers are awaiting, we are informed, without the slightest perturbation.

Attacks on the Fuel Research Board.

A dead-set seems to have been made in certain quarters against the Fuel Research Board; and some of those who have taken part in the attack have introduced an unwarrantable personal note into them. The work of the Board has no doubt been delayed through circumstances the members personally could in no respect control. Their work is entirely research; and it will be largely carried out in the research station at East Greenwich, for the delay in the completion of which the Board are, as has recently been shown, in no wise responsible. They are, we believe, as disappointed as anyone over the delay. To hear, too, some of the accusations made against the Board, any-

one would think there was some deliberate move on the part of members to prevent other people carrying on investigations, whereas in many directions the Department of Scientific and Industrial Research are encouraging the formation of Research Associations, and are contributing from their funds to private and industrial investigation. Their last report shows this. It rests upon the Department to exercise some discrimination as to where and for what purpose they allocate the funds entrusted to them; and where they do not make favourable response to a request for assistance, they may have some good reason, which, however, it may be an act of discretion not to make public. This being so, both sides of the tale are not heard; and we at all events are not prepared to accept the version of everyone who chooses to make an attack. Criticisms have come from several quarters—newspapers in the first place, and from speakers at the meetings of the British Association and the Iron and Steel Institute. Some of these quarters can be well ignored. It is a pity that technical papers accept all that is said as being gospel, without carefully looking into the matter on their own account. Sir George Beilby and his colleagues stand well above the imputations that have been made, and can afford to refuse to pay any attention to them.

Nationalization of the Coal Mines.

The nationalization campaign among the coal miners has commenced. Mr. Robert Smillie is, of course, at its head and front, and he is preachiug the omnipotence of the industrial strike weapon when it is wielded in unison. At one meeting he has informed the miners that whether it was next week, next month, or next year, the mines would become national property in the near future; and the miners would have a voice in their management. And at another meeting, he stated very positively that the nationalization of the mines would only be a beginning. Now we know.

Benzol for Motor Cars.

The feeling seems to be abroad that there is a strongly organized opposition to the use of benzol for motor car purposes. The testimony as to advantage is of a very solid character; and yet complaints are persistent week by week of inferior quality and of bad results. The "Motor," which has vigorously championed benzol, refers in its last issue to the supply being in a very unsettled and indifferently organized state; and it adds: "The, price of benzol varies between 5s. 4d. and 6s. per two-gallon tin; and it is peculiar that the higher the price the poorer the quality. One of the greatest drawbacks to the spirit is that distributors wilfully or otherwise, leave a distressing amount of dirt in it, with the result that choked jets are difficult to avoid. It would perhaps be going too far to say that an effort is being made to freeze-out the opposition fuel by selling it at a high price and low quality, with the effect that the motorist eventually will not demand it. To our minds the situation requires investigation." In another article, our contemporary points to the necessity, when using pure benzol, of making modifications in some standard carburettors intended for the use of petrol. These alterations are quite simple; but they vary according to the carburettor in use. A different-sized jet may be required; it may be necessary to weight the float or adjust the air admission, and to adopt a method of heating. Our contemporary published some recommendations as to how to make the requisite adaptations to secure maximum results.

Among the latest wills proved is that of Mr. W. J. Rees, one of the Directors of the Swansea and Pontardulais Gas Companies, a former Mayor of Swansea, who left personalty of £157,559.

After a visit on Wednesday of next week by members of the Manchester and District Junior Gas Association to the works of Leyland Motors (1914), Ltd., Mr. W. H. Postlethwaite, of Salford, will read a paper on "Efficiency of Boilers and Power Distribution" (see p. 720).

In Switzerland the Gas-Works Union (the "Engineer" states) require an ash guarantee for washed products and screened coal. For an excess of ash content above a given average a reduction in price is demanded corresponding to the excess; while on coal having an ash content less than the standard amount an increase on the price is allowed. A similar practice has been established in Sweden, where a reduction of 1d. per ton is made for every ½ p.ct. of ash above 6 p.ct.; and an increase of 1d. per ton for every ½ p.ct. below 4 p.ct.

TEMPORARY INCREASE OF CHARGES ACT.

New Applications and Orders.

APPLICATIONS have been made by the following authorities to the Ministry of Health for Orders under the Statutory Undertakings (Temporary Increase of Charges) Act:

Abercarn Urban District Council,
Ellesmere Port and Whitby Urban District Council,
Goole Urban District Council.
Morecambe Corporation.

Orders have been made by the Ministry of Health authorizing the Festiniog Urban District Council and the Morley Corporation to increase the price of gas from 5s. 6d. to 6s. per 1000 c.ft.; the Oldbury Urban District Council from 4s. to 5s. per 1000 c.ft.; and the Rickmansworth Urban District Council, from 5s. within the district and 5s. 5d. beyond, to 6s. 10½d. within the district and 7s. 6d. per 1000 c.ft. beyond.

PERSONAL.

Lightening his work on the advice of his medical adviser, Mr. R. S. GARDINER is resigning the chair of the British Gas Light Company, Ltd. But the Company will not be deprived of his far-reaching knowledge of its affairs, and of his extensive experience in the gas industry, because he has consented to remain an ordinary member of the Board. It was forty years ago that Mr. Gardiner was appointed—this was on Sept. 1, 1879—Secretary of the Imperial Continental Gas Association, in succession to Mr. Albert F. Jackson who the previous June had resigned on account of ill-heath. The position of Secretary of the Association Mr. Gardiner relinquished some years since in order to devote himself to other interests in which he is so largely concerned.

Consequent on the acquisition of the undertaking of the Longwood Gas Company by the Huddersfield Corporation, Mr. J. H. BREARLEY, who has been engaged with the Company for a period of twenty-three years, ceased his connection with the undertaking as from yesterday. Mr. Brearley was selected to fill the appointment in 1896, out of a hundred applicants. He intends shortly to take up his residence in Southport.

Major J. C. WYNNE, who holds a staff appointment, has, for reasons of health, resigned his position as Assistant Gas Engineer to the Blackburn Corporation. He never completely recovered from the wounds that he sustained in the Dardanelles, and at the present time is in the York Military Hospital. Major Wynne served his articles in the Blackburn Gas Department under Mr. Samuel Ogden; and, on the appointment of Mr. H. Davies to Brighouse, he was selected as Assistant Engineer. He held a Commission in the 4th East Lancashire Regiment (Territorials(before the war, and accompanied the Battalion to Egypt in the early days of hostilities.

At Coventry, on the 20th inst., the marriage took place of Mr. PERCY NORMAN LANGFORD, the Engineer and General Manager of the Coventry Corporation Gas Department, to Miss AMY FLORENCE ROSE.

Mr. HAROLD J. HAILSTONE, of West Bromwich, has been appointed Chemist at the gas-works of the Rochdale Corporation. He succeeds Mr. T. Stenhouse in this position.

Mr. EDWARD CROWTHER, of the Aldershot Gas, Water, and District Lighting Company, has been appointed Second Assistant to the Gas and Water Engineer of the Wallasey Corporation.

Output of Gas in America.

Mr. C. E. Lesher, of the United States Geological Survey, has collected statistics, as a result of which he reports that the sales of artificial gas in the United States in 1917 amounted to 342,151,129,000 c.ft.; the sales of water gas, which amounted to 153,457,318,000 c.ft., representing 45 p.ct. of the total artificial gas used. The gas sold from coal-gas plants (bench retorts) was 42,927,728,000 c.ft.; and that from bye-product coke-ovens, to 131,026,575,000 c.ft. Of oil gas there were sold 14,739,508,000 c.ft. The quantity of coal gas produced in 1917 was 47,525,148,000 c.ft., the manufacture of which required the use of 4,960,297 net tons of bituminous coal, 106,627 gallons of oil, and 1296 net tons of cannel coal. The production of water gas was 174,357,536,000 c.ft., requiring the use of 1,486,305 gross tons of anthracite, 7815 net tons of bituminous coal, 1,448,173 net tons of coke (most of it produced by the same operators in coal-gas retorts), and 684,620,637 gallons of gas oil. To produce 17,552,855,000 c.ft. of oil gas, 137,484,874 gallons of oil were used. The quantity of bituminous coal charged into bye-product coke-ovens was 31,505,759 net tons, which produced 337,728,251,000 c.ft. of gas. The total amount of coke from coal gas plants and of bye-product coke sold in 1917 was 24,296,528 net tons; while the sales of tar from plants manufacturing coal gas, water gas, and oil gas, and from bye-product coke-ovens, were 335,578,441 gallons. The ammonia produced, reported in terms of liquor, sulphate, and anhydrous ammonia, has been computed for convenience as its equivalent in sulphate. Coal-gas retorts and bye-product coke-ovens produced approximately 652,333,000 lbs. of sulphate of ammonia. Water-gas plants reported in 1917, for the first time, a recovery of crude naphthalene.

LOWER GRADE GAS TO BE MADE BY ORDER OF THE BOARD OF TRADE.

Any Excess of Four Hundred and Twenty-Five B.Th.U. an Offence against "D.O.R.A."

THAT the Government were prepared in detail for a national strike, appears to be fully evidenced by the fact that, before we reached the office on Saturday morning, our letter-box contained the following series of Orders from the Board of Trade, with a request that we should give them the utmost publicity. Every gas official must make himself fully acquainted with the Orders, which extend from the making of a lower grade gas so as to ensure coal going as far as possible, to the prohibition of outside use of gas (except by public lighting authorities), and misuse of gas being an offence, with an appeal to all consumers for economy. In all these respects, the Government looks to every responsible gas official doing his duty.

COAL AND FUEL EMERGENCY ORDER, 1919.

Orders Apply as from One a.m. Last Saturday Morning.

I, Sir Evan Davies Jones, Bart., Controller of Coal Mines, hereby declare that, as and from 1 a.m. on Saturday the 27th day of September, 1919, a state of emergency as contemplated by Clause 1 of the above Order exists, and that therefore the terms and provisions of the above Order come into effect as and from that time and continue in force until further notice by me.

EVAN D. JONES,
Controller of Coal Mines.

Coal Mines Department, Holborn Viaduct Hotel,
London, E.C., Sept. 26, 1919.

BOARD OF TRADE NOTICE.

Consumption of Coal, Gas, and Electricity to be Reduced.

In order to ensure the maintenance of essential supplies of food during the railway strike, it may be necessary to suspend entirely the transport of coal. The Board of Trade, therefore, wish to impress most strongly upon every member of the public that it is his personal duty to cut-down his consumption of coal, gas, and electricity to the lowest possible limit, so as to conserve the stocks of coal that are available.

Further, the Board of Trade announce that Emergency Orders have been issued:

(1) Requiring gas undertakings to manufacture gas in such a way as will enable them to spread the consumption of their supplies of coal over as long a period as possible, while still supplying gas of serviceable quality.

(2) Requiring the discontinuance of all outside advertisement or display lighting on any premises, and also of any inside advertisement or display lighting in shops after closing thereof.

(3) Limiting purchases or deliveries [of coal] for household consumption to 1 cwt. per week; prohibiting purchases by, or deliveries to, persons who have more than 10 cwt. in stock; and giving power to Local Fuel Overseers to require registration of all consumers and to cut off supplies of gas or electricity where there is waste.

Board of Trade, Sept. 26, 1919.

1.—GAS AND COAL (EMERGENCY) ORDER, 1919.

Made by the Board of Trade under Powers conferred upon them by Regulations 2 F and 2 JJ of the Defence of the Realm Regulations.

The Board of Trade, deeming it expedient to exercise the powers conferred upon them by the Defence of the Realm Regulations for the purpose of maintaining and regulating the supply of gas and coal, hereby order as follows:

1. This order shall apply to all gas-works throughout the United Kingdom.

2. No persons who supply gas under statutory authority shall use, or permit to be used, in the production of gas a greater amount of coal than will suffice to produce gas of a quality 15 p.ct. lower than the quality prescribed by any Special Act or Order for the time being applying to their undertaking.

3. No other persons who supply gas shall use, or permit to be used, in the production of gas a greater amount of coal than will suffice to produce gas of a calorific value not exceeding 425 B.Th.U. gross.

4. With the object of maintaining, so far as may be, a supply of gas at adequate pressure during such periods of the day or night, whether continuous or discontinuous, when the effective use of it in consumers' fittings and apparatus is—having regard to local conditions and requirements—most required (such periods being hereinafter referred to as the first-mentioned periods) persons who supply gas under statutory authority shall supply the same at other periods of the day or night (whether continuous or discontinuous) at a pressure so much lower than that prescribed by any Special Act or Order for the time being applying to their undertaking as may be best calculated to secure a supply at adequate pressure during the first-mentioned periods; and other persons who supply gas shall supply the same at such other periods of the day or night (whether continuous or discontinuous) at a pressure so much lower than that usually supplied by them as may be best calculated to secure a supply of adequate pressure during the first-mentioned periods.

5. All persons supplying gas shall notify the local authority of the district by notice in writing, and shall notify their consumers by newspaper advertisements and placards of such periods of the day and night during which the pressure of gas will be insufficient to permit of its effective use in consumers' fittings and apparatus.

6. Infringements of this Order are summary offences against the Defence of the Realm Regulations.

7. This Order may be cited as the Gas and Coal (Emergency) Order, 1919.

Dated this 26th day of September, 1919.

A. C. GEDDES,
President of the Board of Trade.

2.—STATUTORY RULES & ORDERS: DEFENCE OF THE REALM.

The Lighting, Heating, and Power (Emergency) Order, 1919, made by the Board of Trade under Regulations 2 F and 2 JJ of the Defence of the Realm Regulations.

The Board of Trade, deeming it expedient to exercise the powers conferred upon them by the Defence of the Realm Regulations, for the purpose of maintaining the supply of coal, gas, and electricity and other articles of commerce required for lighting, heating, and power purposes hereby order as follows:

(1) All lights of the following classes and descriptions shall be extinguished, and such lights shall not be lighted at any hour except as provided in paragraph (2) hereof.
  (*a*) Sky signs, illuminated facias, illuminated advertisements, and other lights used outside of, or at the entrance to, any premises for the purpose of advertisement or display.
  (*b*) Lights used inside any shop for the purpose of advertisement or display when the shop is closed for serving customers.

(2) This Order shall not apply to any public street light or any other light approved by the Chief Officer of Police as necessary in the public interest.

(3) The expression "shop" in this Order has the same meaning as in the Shops Act, 1912.

This Order shall apply to the whole of Great Britain, and shall take effect on the signing hereof.

Dated this 26th day of September, 1919.

A. C. GEDDES,
President of the Board of Trade.

3.—COAL AND FUEL (EMERGENCY) ORDER, 1919.

Made by the Board of Trade under Regulations 2F, 2J, and 2JJ of the Defence of the Realm Regulations.

The Board of Trade, deeming it expedient to exercise the powers conferred upon them by the Defence of the Realm Regulations, for the purpose of maintaining the supply of coal and fuel for household purposes, hereby order as follows:

1. The Controller of Coal Mines may by notice declare a state of emergency to exist, whereupon the following provisions of this Order shall forthwith come into force and continue in force until he shall by notice declare the state of emergency to have ceased.

2. This Order shall be read as one with the Household Fuel and Lighting Order, 1919 (hereinafter referred to as the "Principal Order").

3. It shall not be lawful without the previous consent in writing of the Local Fuel Overseer, which consent may be general or special, but, if general, must be with the assent of the Controller:
  (*a*) to purchase, obtain, take delivery of, or in any way acquire more than 1 cwt. of coal in any week for consumption in any premises coming within the scope of the Principal Order;
  (*b*) to purchase, obtain, take delivery of, or in any way acquire any coal for consumption in such premises as aforesaid where the quantity of coal available for consumption in such premises exceeds 10 cwt.

4. A registered coal merchant or licensed coal dealer shall not, without the previous consent in writing of the Local Fuel Overseer, which consent may be general or special, but, if general, must be with the assent of the Controller:
  (*a*) sell, supply, deliver, or in any way dispose of coal for consumption in any premises coming within the scope of the Principal Order in excess of 1 cwt. in any week;
  (*b*) sell, supply, deliver, or in any way dispose of coal for consumption in such premises as aforesaid where the quantity of coal available for consumption in such premises exceeds 10 cwt.

The provisions of this clause shall not apply to coal sold, supplied, delivered, or otherwise disposed of for the purpose of the trade or business of distributing coal.

5. A person may be required by the Local Fuel Overseer to register with a registered coal merchant or licensed coal dealer for any supply of coal under this Order, and in such case can only acquire his supply from the merchant or dealer with whom he is registered. Registration under the Principal Order shall be deemed to be sufficient for the purpose of this Order; but a Local Fuel Overseer may, in his entire discretion, transfer any registration for the period during which this Order is in force from one registered coal merchant or licensed coal dealer to another, either by specific transfer for that purpose or by

general regulation duly approved by the Local Fuel and Lighting Committee.

6. The Local Fuel Overseer may direct that any supply of gas or electricity covered by the Principal Order be cut off where there is reason to believe that the supply is being abused or used in excess, so as to prejudice the interests of the public.

7. Where the Principal Order is in conflict with this Order, this Order shall prevail; but otherwise the Principal Order remains in force. There shall be no claim for any allowances of coal under the Principal Order so long as this Order continues in force.

8. Infringements of this Order are summary offences against the Defence of the Realm Regulations.

9. The Local Fuel Overseer may, with the assent of the Controller, take any action necessary for the enforcement of the provisions of this Order, or the Controller may take such action.

10. This Order may be cited as the Coal and Fuel (Emergency) Order, 1919.

Dated this 26th day of September, 1919.

A. C. GEDDES,
President of the Board of Trade.

ELECTRICITY SUPPLY MEMORANDA.

THE vision is fast fading of many enthusiastic members of the electricity supply industry, of becoming the sole power suppliers of the country. The mistake that they have been making is in failing to recognize that they have not the monopoly of development. With all power agents advances are being made which increase efficiency, and the increased efficiency means permanent economy. Within industries developments are proceeding which will deprive the electrical industry of large consumers, and of tributaries of waste heat of which there was at one time hope of obtaining large possession. Industries are being shown how they can themselves develop their activities and economy by utilizing their own waste heat; and if there is money in it, they will do it. If the technical men of the electrical industry will carefully peruse the papers and the reports of speeches at the meeting of the Iron and Steel Institute, they will find how little was said about the electrical power scheme, and how much was said as to the development of the iron and steel industry on the lines of a self-utilization of waste heat, and largely through the employment of gas-engines. And be it marked, this was not by men who are professionally engaged in the gas industry or in the production of gas-engines. The men of the electrical industry have been too fond of belittling their power competitors, and have pretended to be blind to the fact that the gas-engine of modern times is not the engine which they assert should have the honour of being placed in a museum as typical of what obtained before the electric-motor came on the scene.

No Monopoly of Power.

The members of the Iron and Steel Institute heard a good deal of a constructive nature; and if they do as they are advised, they will undoubtedly produce some valuable economies and expansion of activities. The con centration of coke-oven, blast-furnaces, and rolling-mill plants the utilization of waste gases for heating and power, and scientific supervision and control will make the owners of such establishments masters of more than they at present survey. There is much that is common between Prof. Bone's advice and the report by Mr. Cosmo Johns and Mr. Lawrence Ennis upon what they saw at some big factories in the occupied territory on the left bank of the Rhine. Germany is sometimes held up by the British electrical industry as an example of advanced development. But here we have these reporters telling us that nothing was more suggestive to them than the use made of large gas-engines. There they witnessed in these extensive industrial establishments central stations with ten, twelve, or more gas-engines of 1500 to 5000 H.P., utilizing fuel gas. The more modern the works, the more are gas-engines employed, and the over-all efficiency from fuel to power generated is greatly in favour of the gas-engine, compared with using the gas for steam-raising, and the steam in turbines. To meet fluctuating demands, steam-turbine generators are installed to assist the gas-driven generators. This forms an elastic combination. But the gas-engine is the predominant partner. Economizing of heat is in one example quite a refined art. Effective use is made of the heat in the waste gases from the large gas-engines; and if the cooling water of the gas-engine is used as the feed water for the waste-heat boiler, there would be a combined efficiency that would be unapproached by any other prime mover. The more progress of this sort is made, the less will be the call upon coal in proportion to production; and the less will distributed electricity be called for by extensive industrial works. There are lessons here which should have the effect of again bringing down to earth those electrical men who have allowed their enthusiasm to carry them beyond the region of commonsense. A very striking statement as to electric power not securing a monopoly of supply among manufacturers was made by Mr. C. E. Stromeyer at the recent meeting of the British Association; and some figures that will shock many an electrical man were given on his authority in the letter that appeared in our columns last week signed "Unrestricted Progress." Mr. Stromeyer speaks from experience; and he quite agrees that electric power has great advantages, especially in works where little heat is required. His principal point, however, is the same as the one made recently in our columns in dealing with the extensions at the Stafford Gas-Works [see Aug. 19, p. 383]—that, where there is a constant load, electricity is not the cheapest power agent; where there is an intermittent load, there is both convenience and economy in electricity. Mr. Stromeyer says that in shipyards and works of that description, where machines have to stand idle for long periods, electricity is much more economical than steam. In those cases energy from a large power undertaking is a great advantage. But in factories working continuously at a set speed, there cannot be a better arrangement than to produce the power on the works.

Lessons from Germany.

When the Standing Committee dealing with the Electricity Supply Bill reassembles, they will have to consider clause 9, which is of vital importance to the manufacturer generating his own electricity. It contains a proposal which, in the cause of freedom and progress in private enterprise, must be modified. As the clause stands, private generating stations will not be taken over; but new private stations or extensions of old ones would have to be authorized by the Electricity Commissioners, regarding the type of current frequency and pressure. The Sub-Committee of the Federation of British Industries who are dealing with the Bill on behalf of the Federation are of opinion that manufacturers should be absolutely free regarding the production and supply of current for private use; and so they have put forward amendments to ensure to manufacturers the full right of self-supply. This would act as a stimulus to the Electricity Authority or Board to supply power in its own area as efficiently and economically as possible. As the clause stands at present, manufacturers would be at the mercy of the Electricity Commissioners, and would appear to have no appeal from their decisions.

The Full Right of Self-Supply.

Leaflets issued by the Electrical Development Association are getting into circulation; and the circulation has brought four samples into our hands. Having read them, we do not appeal for mercy. Over all the leaflets there is seen the limiting difficulties of our friend, Mr. J. W. Beauchamp. We are not going to criticize in detail the contents of the leaflets, because in them there is, up to a point, a very wise moderation. Of course, something has to be said by their author; and he cannot avoid a little extravagance in putting a good face on electricity in comparison with its competitors, which extravagance we should have no difficulty in proving. There is one of the leaflets entitled "Britain's Buried Treasure;" and it does not deal with the "buried treasure," but what was buried, and has been brought to the surface of the earth for practical and economical use. The leaflet is not intended for the scientific or technical man, but the great public who do not possess the qualification for testing the accuracy of the statements other than through their purses. This is a sample statement in it: "Only by abandoning the old wasteful methods of coal conversion can we make every ton of our buried treasure give up its maximum of usable light, heat, and power." This is quite true. But after the abandonment, What then? The author tells his readers that, by the direct use of flame and fire, they can never get the percentage of usable light, heat, and power that can be given by great industrial works and power stations, "where coal is converted into electrical energy under scientific control, and where the resources of modern engineering are employed to secure from every ton the greatest possible yield of light, heat, and power." When we come to remember that in an ideal area of supply there are one or two stations using about 2½ lbs. of the once-buried treasure per unit of electricity generated, and numbers of others in the country employing anything from that amount up to between 16 and 17 lbs., we smile over the "scientific control" and the assertion that "the resources of modern engineering are employed to secure from every ton the greatest possible yield of light, heat, and power" in the central stations of the country, and ponder over the phrase as to "the old wasteful methods of coal conversion." The author of the leaflet knows how very easy it is to show that the circuitous course of using bituminous coal under a boiler to produce steam, and the steam in a turbine for driving a dynamo to obtain electrical energy, is not so efficient and productive as is the carbonization of the coal at a gas-works. As previously said, we will not criticize the leaflets in detail, as we recognize that Mr. Beauchamp has no intention of conducting his campaign in a venomous style. But if he would like to show through a leaflet the relative amounts of light, heat, and power (power under long-hour use and a fairly even load), that the householder or the factory owner can get for a given sum of money, we shall be very happy to assist him to compile one. It might perhaps take the form of an open discussion.

Developing Literature.

Not long since, it was noticed that the Electrical Development Association were calling out to the dilatory ones to come along and subscribe funds for supporting their efforts, and showing cause why they should do so. The replies, it is now stated, have been "numerous and satisfactory."

Subscriptions for the E.D.A.

Nevertheless another appeal is being made, which raises a doubt as to the standing of the expression "numerous" and as to the degree of the satisfaction. "The list of potential members has not by any means been exhausted," writes the "Electrical Times." Hence the renewed appeal. The "Electrician" urges all who are invited to subscribe "to look upon the broad issues rather than upon the narrow benefits." Those who have doubts should bring them before Mr. Beauchamp.

On a Small Basis. The small gas and electrical companies are having a hard time of it under the economic terms of to-day, which promote the contrary conditions to prosperity—a heavier expenditure and a smaller income than under the circumstances ruling before the war. The "Electrical Review" refers to the critical state of the large number of isolated electricity company undertakings of less than 500 KW. capacity in various parts of the country. The business of these concerns is of such a limited order, and their opportunities for expansion so lean, that even a large percentage increase in the price per unit does not compensate for the bloated increases of costs which they have to meet. The "Review" appears to blame the Statutory Undertakings (Temporary Increase of Charges) Act for not allowing adequate relief. We do not see where this comes in; as discretionary power according to circumstances is given to the Board of Trade. It is more likely that the real trouble is to be found in the fact that the heavier the charges for current, the more attenuated the business becomes, and thus the less it is able to meet the considerable costs of production. It is hoped by our contemporary that, when the Electricity Commissioners are established and in working order, they will be able to give relief; anyway it sees the small companies benefiting under the district schemes. The case of the small gas companies is very hard; seeing that dear coal is at the base of their operations, and transit and labour cost so much. Material (delivered on the works) and labour in gas making are responsible for a very large proportion of the outgoings of the undertakings; while capital and distribution charges, speaking generally, account for approximately an equal percentage in the case of electricity concerns. Most of the electric machinery and plant were of pre-war purchase; so that the small electricity undertaking ought really in present circumstances to be in a better position than the small gas undertaking. Where small gas undertakings are being particularly hard-hit in these times is where they have to compete with one of the large electric power companies; and this is becoming very evident in the number of local authorities of small places who are grumbling over the increased charges of gas for public lighting, and are turning to the large electric power companies, who are in a position to take on the business on relatively better terms than those prevailing in such areas for gas—the present position being in their favour compared with the small gas company. The same position obtains where a large gas undertaking is competing in an outlying district with a small electricity company.

Illumination during the Reconstruction Period.

In a paper submitted by him to the Chicago Section of the American Illuminating Engineering Society, Mr. S. E. Doane said the problem which illuminating engineers are facing to-day is indicated by the various demands for light for the industries and the other activities of life. Everyone knows that we can get along with much less light in streets than we can in the lighting of homes, theatres, and manufacturing places; but very few appreciate the problems involved in supplying a satisfactory system of illumination for all these various locations. The time is ripe for illuminating engineering to be put on the same practical basis as other branches of engineering; and to do this it is necessary to attempt some definite method of procedure. He suggests, first, that the foot-candle must be established as a definite unit for common use, and that it must be made well known. The time had come when every institution of higher learning should teach the value of the foot-candle, and should instruct their pupils that light is measurable as absolutely as is length. Of the three considerations of good lighting—quality of light, direction of light, and quantity of light—he considers the quantity of less importance than the other two. As to light quality, the public are accustomed to regard this as the name of an indefinite something of which the scientist has knowledge, rather than as a practical consideration for practical people. It has long been appreciated that light modified by coloured shades has its uses; while in other operations the lamp giving daylight values is much to be preferred. He knows of no way of measuring these conditions with anything like the facility with which one can measure foot-candles, and that "we are unfortunately not yet in the position to recommend that the public make common acquaintance with the problem of light quality."

Heat Standard for Gas in California.—As from the 1st inst., all gas supplied to consumers by undertakings in California must contain 570 B.Th.U. on an average each month, with a variation of not more than 30 B.Th.U. No exception is permitted, except by special exemption of the Commission. The order also provides a complete set of general rules governing the relations between gas utilities and their consumers. In order to regulate the gas supplied, the Commission will give regular attention to all the gas plants by inspection and testing.

BRITISH MINERAL OILS.*

THE very comprehensive title given to this work, and the use of the term "treatise" would lead the reader to expect to find in it a full discussion of the subject—including matters relating to the possibility of the discovery in quantity of crude petroleum in the British Isles, a full description of the processes at present in use for mineral oil production here, and a discussion of the possibilities of further production of oil from other sources. In fact, however, the discussion is limited to the last of these subjects, and is mainly concerned with the possibilities of the production of oil by carbonization processes from the oil-shales, cannels, and allied minerals available in Great Britain, where the primary product aimed at is the oil; the gas, ammonia, and solid residue simultaneously produced being bye-products.

There is further no serious discussion of the economic side of the question, or any estimates of the cost of production of the oil, by the methods in question; and while it is no doubt impossible under present conditions, and in the present state of knowledge, to make any estimates which can be regarded as of even approximate accuracy, some discussion of this fundamental side of the question might reasonably be expected in a book claiming to be a "treatise" on the subject.

The book consists of several sections, written by independent contributors under the editorship of Mr. J. Arthur Greene; and it may be regarded as generally expressing the views of the Committee of the Institution of Petroleum Technologists appointed to consider "the production of oil from cannel coal and allied substances"—all the contributors being either technical advisers to the Committee or closely connected with its work. The section on "Geology" is contributed by Mr. Cunningham Craig; that on "Retorting," chiefly by Dr. Ormandy, Dr. Mollwo Perkin adding a brief chapter on "Practical Experimental Work," while Dr. Dunstan is responsible for the section that treats of the "Products from Low-Temperature Carbonization and their Chemical Nature." There are also short contributions from Mr. Andrew Campbell, suggesting a scheme for the "Refining of Low-Temperature Crude Oils," and another by Mr. A. H. Seabrook on "Power." The first three sections take up 190 of 210 pages.

As it is almost universally agreed that, in order to obtain the maximum yield of oil by retorting any carbonaceous substance, the volatile products first produced by the action of heat must be removed before they are subjected to the action of higher temperatures, the greater part of the book dealing with carbonization is naturally taken up with the consideration of low-temperature carbonization. But this part is mainly concerned with such carbonization of oil-shales and cannels, primarily for oil production; and, excepting incidentally and for the purposes of comparison, no attempt is made to discuss the much-debated question of the low-temperature carbonization of bituminous coal for the production of smokeless fuel and gas. It is fully recognized that the quality and quantity of oil obtainable from the low-temperature carbonization of such coal is far inferior to that obtainable from shale and cannel, and that where the primary product aimed at is either gas or hard metallurgical coke, the problem is of a very different nature, and that for such manufacture—unless special considerations come in which make the bye-products of higher importance than the primary products—gas or hard coke—high-temperature carbonization is required in such manufacture. The different authors also, for the most part, recognize the inherent difficulties of low-temperature carbonization which have to be overcome—namely, the length of time required to complete the decomposition at low temperature, and the consequent increase in the capital cost of the necessary plant per ton of material carbonized, and of the operating costs. They also frequently point out the serious manner in which the proper investigation of low-temperature carbonization—whether as applied to smokeless fuel production or to oil manufacture—has been jeopardized by the gravely exaggerated claims made with regard to it, and by the financial methods adopted in promoting many of the companies formed to carry out some of the processes proposed.

The first section—on the geology of the subject, by Mr. Cunningham Craig—goes at some length into the origin of oil-shales and cannels, and in respect to the former it develops at some length the author's theory of their method of formation, according to which these deposits derive their carbonaceous matter from old adjacent oil-bearing strata which have now disappeared. All theories as to their animal origin Mr. Craig entirely rejects. His view is, as the author very fairly states, strongly opposed by other authorities; and the present reviewer feels that his own knowledge of the geology of the subject is too limited and fragmentary to enable him to express any judgment in the matter. It may also be pointed out that Mr. Cunningham Craig does not seem to have convinced all his fellow contributors in the matter, for Dr. Dunstan in his section states that animal and vegetable remains furnished the organic matter found in oil-shales. With respect to cannel and allied deposits, Mr. Cunningham Craig has adopted in general the usual "swamp" origin theory; but at the same time he regards them as related to petroleum, and suggests that the yellow "kerogen" particles in them, which are largely

* "A Treatise on British Mineral Oils." Editor: J. Arthur Greene. Contributors: E. H. Cunningham Craig, W. R. Ormandy, F. Mollwo Perkin, Andrew Campbell, A. E. Dunstan, and A. H. Seabrook. Foreword by Sir Boverton Redwood, Bart. London: Chas. Griffin & Co., Ltd.; 1919. 21s. net.

responsible for their oil-yielding properties, are really an intermediate material formed from the original animal and vegetable matter, which usually passes into the form of oil on the one hand or coal on the other, but is retained as such in the cannels.

The author uses the term "cannel" for the whole of the materials of this class, and divides them up into two sub-classes: (1) The "Torbanites" and (2) the "Parrots." Of the former class, which are those especially rich in the yellow "kerogen" particles, the boghead cannel at Torbanehill is the first and best-known representative (though now exhausted); and according to Mr. Craig such torbanites are distributed in different parts of the world to a very much greater extent than is usually recognized. The "Parrots" include, according to the author's definition, gas-coals, parrot coals, and materials known by local names—such as "jacks," "rattlejacks," "gees," &c. [The use of the term "gas coal" in this connection is apt to cause considerable confusion, in view of the fact that the term "gas coal" is ordinarily used to specify such bituminous coals as are especially suitable for gas production. What appears to be intended above by this term is those classes of "cannel" which were formerly largely, and are still sometimes, used for gas manufacture.] It is, however, well recognized that any exact division into classes is impossible, as no sharp division exists between the different deposits, which show a more or less regular gradation—from boghead cannel on the one hand to the poorest bastard cannels on the other.

With regard to the important question of the available extent of deposits of oil shale and cannel in the British Isles, Mr. Cunningham Craig, while acknowledging that the evidence as yet available does not admit of the formation of any exact estimate, is distinctly optimistic as to their magnitude. With regard to shale, while the richest Scottish fields have probably already been to a considerable extent exhausted, Mr. Craig regards the opening-up of new fields there as quite possible, although these will probably be found more costly in mining, and not capable of so high a yield of oil, as the present Midlothian shales. Large developments in the production of Kimmeridge oil-shales from Dorset and Norfolk are regarded as possible, though such development is contingent on the successful working-out of an economical process for the removal of the excessive quantities of sulphur present in the oils produced from these shales.

With regard to cannel in its several forms, a distinction may be made between the various relatively small deposits obtained incidentally in mining for ordinary coal, and brought to the surface with it, or left in the mine as not worth bringing up, and the cannel existing in seams of sufficient depth and area to permit of its being specially mined for oil-production. From the former sources, Mr. Craig states that, at a conservative estimate, a yield may be expected amounting to from 13,000 to 14,000 tons a day of material worth retorting, and give an average yield of 25 to 30 gallons of crude oil per ton. While the reviewer regards this weight as a possible estimate, the results he has obtained from examination of a considerable number of these cannel residues, indicate that, on the average, nothing like the above quantity of crude oil per ton would be obtained in practice, and that the average quality of the crude oil produced would be a low one. Into the question of the opening-up of known existing cannel seams, and the important question of the cost of mining them, Mr. Craig does not enter. Indeed, under present conditions with regard to mining, it would be impossible to make even an approximately accurate estimate. Previous experience indicates, however, that owing largely to the hardness of the cannel, and to its most commonly occurring only in thin seams, the cost at the pit-head would be much higher than that of bituminous coal, and that such mining would only be economically practicable where the particular cannel gave a high oil-yield.

Dr. Ormandy in the section on "Retorting," gives a good general account of the action of heat on carbonaceous matter in the absence of air—having regard to the complexity of the subject and the limitations of space available in a work of this kind. It is followed by a general description of the different methods of retorting, whether at high or low temperature. Detailed descriptions are given (with illustrations and large folding plans) of the Glover-West continuous vertical retorts, the Coppée bye-product coke-oven—regarded as representative of modern high-temperature carbonization, and of the Tozer retort, the del Monte retort, and the Maclaurin producer—representing low-temperature carbonization plant. In addition, ammonia-recovery producers are also considered—namely the Mond, Moore, and Wollaston producers. These are, however, only indirectly connected with the question of oil-recovery, being required because with most of the materials employed for oil-production by retorting, the residue obtained will usually be too high in ash to be suitable for sale as a solid fuel; and in this case the most suitable use for it (provided the percentage of ash is not too high) is to employ it in such producers for making producer gas and ammonia.

Generally speaking the descriptions given are readable and accurate, the illustrations clear, and the results obtained by the various processes fairly summarized. Some of the minor statements would certainly not meet with universal acceptance; but, in view of the complexity of the subject and of insufficient experimental evidence in regard to many points, this would be the case whoever was the writer. At times, too, Dr. Ormandy brings into discussion matters having only a very indirect bearing on the matter of oil production, which, however important in themselves, seem to be a little out of place in a work having the specific objects of the book under review.

In considering the question of carbonization in continuous vertical retorts, Dr. Ormandy rightly points out that, although high external retort temperatures are employed in such retorts, the products may be regarded as being partly obtained by high-temperature and partly by low-temperature carbonization; and he makes a rough estimate that, of the crude tar formed, two-thirds consists of high-temperature products and one-third of low-temperature products. This arises from the fact that in such retorts, as compared with horizontal retorts or coke-ovens, the volatile products first formed in all cases from the coal at low temperatures are able to escape from the heated retort without being raised to anything like so high a temperature on the average as is the case in horizontal retorts or coke-ovens. He does not, however, emphasize the fact that in this connection he is speaking of the carbonization of caking coal in these retorts, in which case the above approximation of two-thirds high-temperature tar and one-third low-temperature tar appears reasonably probable. Nor does he point out that, when the material carbonized in these retorts does not undergo semi-fusion during carbonization (as is the case with most cannels), the tars obtained consist almost wholly of low-temperature products, even when very high external temperatures are used. This arises from the fact that when no semi-fusion occurs, the volatile products first evolved from the material at low temperatures can and do for the most part escape from the retort through the interstices of the cool uncarbonized material. In fact, the oils obtained from non-caking cannels when carbonized in these retorts at high temperatures, differ but slightly, both in quantity and quality, from those obtained from the same cannels by carbonization in low-temperature retorts at temperatures not much exceeding 450° C.

In writing the third section, on the "Products of Low-Temperature Carbonization and their Chemical Nature," Dr. Dunstan has had a somewhat difficult task—partly owing to the limited extent to which these have been as yet properly investigated, and partly because of the very varying reliability of the different published records in the matter. Upon the whole, he has succeeded in preparing a good general summary of the statements that have been made in the matter, which will be useful to many—especially as these are distributed in so many different publications and journals, which renders it difficult for most people to find them. In making use of it, however, it must be borne in mind that the reliance to be placed on the accuracy of the different results given is very variable. To take one instance only, it is stated on the authority of Foxwell (p. 143), that in the low-temperature distillation of coal yields of 5000 c.ft. of gas of 1000 B.Th.U. and of 20 to 28 lbs. of ammonium sulphate are obtained per ton—figures which are so high that one would require a good deal of experimental evidence before accepting them. Both in this section and throughout the book, too little emphasis is laid on the very great difference in the quality of the crude oil obtained from the different varieties of the same general class of raw material—*e.g.*, the different qualities of cannel, and the mere statement of the quantity of crude oil obtained per ton is quite insufficient without any figures as to its quality.

The remaining three sections are quite short, and do not call for extended comment. Section IV., on refining, by Mr. Andrew Campbell, enunciates a scheme for the working-up of low-temperature crude-oil. While the scheme proposed—based as it is very largely on the methods adopted in the Scottish shale-oil industry—would probably be suitable for dealing with crude-oils from cannel of high quality, it would appear to require considerable modification to suit low-temperature crude oils from coal or the poorer qualities of cannel. Although the future may show the presence in these oils of valuable substances which are worth special plant for their recovery, it is most probable that, at first, all that would be required for these is plant for their distillation, and recovery of the motor-spirit, fuel-oil, tar-acids, and pitch contained in them.

The short section on practical experimental work, by Dr. F. Mollwo Perkin, is disappointing, as it merely mentions the already known fact that the Midland Coal Products, Ltd., have obtained a site at East Kirkby, Notts., to carry out the much-needed investigation of low-temperature carbonization on a semi-manufacturing scale. He gives a ground plan of the site and a very diagrammatic plan of rectangles and circles indicating roughly the disposition of the proposed plant. It may be readily understood that it is not permissible at present to give further information; but in these circumstances the section might well have been omitted altogether. This last remark also applies to the contribution of Mr. A. H. Seabrook in Section VI., having the very comprehensive title "Recovery of Bye-Products from Coal and the Generation of Electrical Energy." This is practically confined to a two-page discussion of the advantages of gas for firing boilers, as compared with the use of solid fuel.

The seventh meeting of the Refractory Materials Section of the Ceramic Society will be held in the Central School of Science and Technology, Stoke-on-Trent, on Wednesday and Thursday of next week (Oct. 8 and 9), under the presidency of Sir W. J. Jones. There are a number of papers on the agenda, including two by Dr. A. Scott on the "Refractory Materials of the North Staffordshire District" and "Expansion of Silica Bricks," and another by Dr. L. Bradshaw and Mr. W. Emery, on the "Specific Heat of Refractory Materials." Prof. T. Gray will open a symposium on "Gas-Firing." There will be a dinner on the Thursday evening, and several works visits are on the programme.

A WORD TO OUR LAMP MANUFACTURERS.

Street Lamp Improvements by Messrs. Tilley Bros.

IN our issue of Sept. 9, there appeared a short editorial article, under the above heading, calling attention to the new lamps that electrical firms are producing—especially for adapting the gas-filled electric lamps (the so-called "half-watt" ones) for street purposes. It was pointed out that they are going about lamp designing in a scientific way, with the view of obtaining from the sources of light as great diffusion as possible. We asked what the gas-lamp makers were doing in this respect? An expensively fitted lamp is a necessity with the gas-filled electric-lamp if the best use is to be made of the source of light, owing to the diffusing properties of such lamps not being of a high order. The expense is much greater, too, on account of the higher costs of materials and labour. This all means that lamps will not be purchasable at anything like the old rates, and that the more parts that are necessitated for the promotion of illumination from a bad light-diffusing source, the more expensive will the lamps be.

This is a point to which Mr. F. C. Tilley (Messrs. Tilley Bros., gas-lamp manufacturers) calls our attention. In his opinion, it will be some time before street-lighting authorities will be prepared to spend more heavily than is really necessary on lamps for street lighting, through the accumulation of circumstances. There is not only the restriction of lighting due to the coal position, and the higher costs through increased prices of materials and labour, but during the past five years street lamps have got into a shocking condition, and renewals in most districts will have to be on a very considerable scale. But as there will have to be extensive renewal, the authorities will be glad to get hold of lamps that, while showing an improvement upon the old-style lamps, will not be so expensive in initial cost as lamps fitted with (say) highly-priced prismatic glass for diffusive purposes; and as there is much better diffusion from a gas mantle than from an incandescent electric lamp, such fittings would be a redundance for gas, and would add to cost initially, for maintenance, and for labour for cleaning. Besides, the use of such expensive glass would only be permissible in well-guarded main thoroughfares, as apart from the effects of wild atmospheric conditions, there is the heavy expenditure occasioned by wilful damage through stone-throwing. To the production of a plain serviceable improved lamp, fitted with reflector, to meet demand upon the restoration of complete street lighting, Messrs. Tilley Bros. have been directing their attention—the lamps being for inverted burners, the diffusion from which is markedly superior to that from upright burners. This is, having regard to the times, quite a moderate priced lamp. It has a good modern appearance, and is strong.

In other forms of lamp which the firm have been engaged in designing, but which are not on the market yet pending completion of the patents, special attention has been given to the question of the protection of mantles and globes. We cannot at present describe the improvements; but one of them provides for the complete and automatic removal of the mantle out of danger when the lamp is receiving the attention of the cleaner. A new means of globe support is the subject of registration; but the difficulty at the moment is to get the globes manufactured in this country. We shall have something more to say about these lamps, when the patents and the market conditions sanction.

A LOW-PRESSURE TINMAN'S STOVE.

While referring to these subjects, Mr. Tilley incidentally mentioned that among other developments of the firm is a low-pressure tinman's stove, which works on the same principle as their well-known high-pressure tinman's stove. The arrangement is such that the new low-pressure stove can accomplish with 14 c.ft. of gas what the old stove required 28 c.ft. to do. A "fine flame" is obtained in the chamber. The gas economy is a big one; and working experience shows that the new stove is quite a good thing. Prompt satisfaction of a growing popularity is impossible through the circumstances of the times. Orders must take their turn.

Sir George Beilby's Experiments.—According to the "Iron and Coal Trades Review," Sir George Beilby has, in his own laboratory, converted 25 tons of coal a day into its constituent parts—leaving a residue which was made into fuel for the people of Glasgow at a cost 50 p.ct. less than coal. This residue, which was sold at 1s. per cwt., was made up into oval briquettes, which burned without smoke and without much ash.

Electrical Influence on Pipes.—Mr. Bennett Chapple, of the American Rolling Mill Company, writing on the subject of the use of rust-resisting metals, points out that underground gas-pipes are subjected to all sorts of conditions that make for corrosion. Electrolysis is generally accepted as the basic cause of corrosion; and with street railways and lighting companies, gas companies, and water companies all using the same streets, the combination of pipes becomes a veritable "pipe organ" for the play of electrolysis. Ordinarily this electrical influence is hardly perceptible; but sometimes it is quite pronounced, as was recently demonstrated by a progressive grocer, who found, quite by accident, that if he connected his water and his gas pipe by a wire attached to an electric bell, it would ring every time a trolley-car turned the corner, half a block away. It was of real service; for it notified customers in time to go out and catch their car.

SIXTY YEARS AGO.

[From the "Journal" for September, 1859.]

Oxide of Manganese for Purification.—Dr. Laming, the original discoverer of the revivification of oxide of iron by exposure to the air—which discovery gave practical value to the oxide of iron process of purification—has recently ascertained that there is an oxide of manganese that may be revived with great facility after having been used in gas purifiers, and which possesses many advantages superior to those of oxide of iron. It is known that many metallic oxides in certain states possess the power of purifying gas from sulphuretted hydrogen. Oxides of manganese, zinc, lead, copper, and antimony, have all been so applied, as well as oxide of iron, though the last one alone has been extensively used for the purpose, on account of the property that it possesses of being quickly revived by absorbing oxygen from the atmosphere, which has given it much greater value commercially than any other. Oxide of manganese, as found native, whether hydrous or anhydrous, will not suit the purpose of gas purification, and has consequently been long since abandoned as useless for practical application. Nor is the hydrated protoxide of manganese, which is obtainable by precipitation, of much use in purification in the state in which it is deposited, although it may be rendered extremely serviceable by subjecting it to subsequent oxidation; and it is in the discovery of this fact that the value of Mr. Laming's new process consists. . . . When placed in the purifiers, it is found to absorb sulphuretted hydrogen very rapidly, and frees the gas from this impurity in a very satisfactory manner. The oxide is converted by the action of the impure gas into hydrated sulphuret of manganese, which is an innocuous substance, and speedily changes when exposed to the air, either in or out of the purifiers, into a revivifiable brown oxide that may be repeatedly used. . . From experiments made by Mr. Laming, it appears that one dry purifier 20 ft. square at work will be sufficient, when the production of gas is 1½ million c.ft. per diem. The oxide is mixed with an equal quantity of sawdust, or other porous inert substance, and the same purifier, when charged with a couple of 2-ft. beds of the purifying material, placed one above the other, will not, it is stated, require revivification until 8 million c.ft. of gas have been purified. The mixture of the oxide of manganese with sawdust is not absolutely necessary; and if used without this addition of inert matter, the effects would be increased nearly in proportion to the increased quantity of purifying material.

Gauging Consumption through Bye-Pass Valves.

There has been devised by Mr. Noonan, who is in the service of the People's Gas Light Company of Chicago, an arrangement whereby the quantity of gas consumed through a bye-pass valve can be accurately gauged. Meters set on industrial installations are furnished with a bye-pass; and if it becomes necessary to remove the meter for any reason, the bye-pass valve is opened, and the supply of gas continued, but unmetered. The device referred to (in connection with which a patent has been applied for) consists of a valve placed on the bye-pass pipe which connects the service to the riser. This valve is connected by a stem to the clock on the Bristol recording gauge placed immediately above it. The action of opening the valve stops the clock and the recording mechanism, thereby definitely determining at what time the meter was bye-passed. A recorder, also actuated by the stem when the valve is closed, indicates the number of times the valve is opened and closed. From these facts and the known capacity of the pipe, it would be a comparatively simple matter to ascertain the amount of gas consumed during the time that the meter was out of commission.

American Gas Association.

Preparations for the First Annual Convention and Exhibition of the American Gas Association, from Oct. 13 to 18, at the Hotel Pennsylvania, New York, are well advanced. Thirty of the papers and reports for the sectional sessions had, when last advices came to hand, already passed through the headquarters office. The Beal Medal (awarded first in 1898 to Mr. H. L. Doherty) will be offered as a mark of honour for the best paper on a technical gas subject presented at the convention. For the exhibition, over a hundred stands have been allotted; and the Manufacturers' Section are offering prizes for the two best papers on the subject of the exhibits. Each of these papers is to be limited in length to a thousand words. The prizes are a $100 and a $50 "Victory" loan note. Early in the proceedings will be the address of the President (Mr. George B. Cortelyou); and the first paper on the list is entitled "What are the Needs of the Gas Industry?" by Mr. H. L. Doherty. Then there are the reports of Committees; and among the other papers for the general session are "The Unsold Market for Gas," by Mr. C. A. Munroe (Vice-President of the People's Gas Light Company of Chicago), and the "Value of the Chemist to the Gas Industry as a Whole through Research Work and the Development of Bye-Products," by Mr. W. H. Gartley (of the United Gas Improvement Company, Philadelphia). Then, of course, there will be the meetings of the separate sections—Manufacturers, Commercial, Technical, and Accounting. In each case the reading of the papers will be preceded by an address by the Section Chairman.

WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION OF GAS ENGINEERS AND MANAGERS.

AUTUMN MEETING AT ABERAVON.

THERE is much to be seen in Aberavon and Port Talbot; and an interesting programme had been mapped-out by the new President for the autumn meeting of the Institution, which was held last Wednesday within the district of the Aberavon Corporation, which, of course, adjoins Port Talbot. Indeed, Mr. A. J. BOND, the Gas Engineer and Manager to the Corporation of Aberavon—who was the new President referred to—had left nothing undone to ensure the comfort and enjoyment of the visitors; and the result was a quite successful day.

For the technical portion of the proceedings, the members assembled in the Aberavon Council Chamber; the chair at the opening being occupied by Mr. R. G. CLARRY, of Swansea (the retiring President).

A WELCOME.

Councillor W. J. WILLIAMS, addressing the members, said he had to apologize for the absence of the Mayor (Mr. S. H. Byass), who was, however, confined to his bed. Mr. Bond was now to be their President; and the Corporation were pleased to know this. They appreciated Mr. Bond, and his long-standing services to them. They looked up to him as a very worthy official of the Corporation. On behalf of the Council, he extended to the Institution a hearty welcome, and expressed the hope that they would have both a profitable and a pleasant meeting.

Mr. R. G. CLARRY returned thanks for the welcome, and said the members were much gratified by the appreciative reference that had been made to the services of Mr. Bond.

MINUTES OF THE LAST MEETING.

The HON. SECRETARY (Mr. Octavius Thomas, of Pentre) read the minutes of the last meeting, and they were confirmed.

It was intimated that there were no new members for election.

THE NEW PRESIDENT.

Mr. CLARRY said his next duty was the pleasant one of formally introducing to them their new President, Mr. Bond. They had already had experience of gentlemen from the district in the presidential chair, and the experience had been wholly satisfactory. Mr. Bond had been with them for a long time, and had assisted them largely in their deliberations. The interests of the Institution would be safe in his hands; and with the same support that the members had accorded to him (Mr. Clarry) during his year of office, Mr. Bond would no doubt have a successful term, of advantage to the Institution.

Mr. A. J. BOND, on taking the chair, was received with applause; and he said he was much obliged to the members for the manner in which they had received the proposition that he should be their President for this year. The President had always had the support of the members during his term of office; and he would confidently look forward to receiving it himself. Though he might not be in a position to do for the Institution what some of his predecessors had done, he could promise them that he would do his best.

THANKS TO THE RETIRING PRESIDENT.

The PRESIDENT said that he had now to propose that a very hearty vote of thanks be accorded to Mr. Clarry for his services as President. He had rendered good services during the year; and the meetings (with him in the chair) had been very successful. They regretted greatly that Mr. Clarry had now not only retired from the position of President, but was leaving the gas industry as a profession. They wished him every success in his new sphere, and knew that if he could be of any assistance to the Institution—as no doubt would be the case—he would give them all the help he could. Probably on some future occasion he would be able to impart to them some useful knowledge on the subject of tinplates. He was going into the tin industry, which was a very important one for gas engineers. Meters made fifty years years ago had a much longer life, he believed, than those of the present day; and this was due, no doubt, to the quality of the tin used. He was sure Mr. Clarry would be able to give them some valuable information as to this.

Mr. J. E. KENSHOLE (Merthyr Tydfil) seconded, endorsing all that had been said with regard to Mr. Clarry's services.

The vote was cordially passed.

Mr. CLARRY, in response, expressed his appreciation of the remarks that had been made, and particularly thanked the members for the support they had accorded him during his year of office. He would, of course, have liked to do more than he had done. There had been several important events over which he had had no control. In the first place, there was the termination of hostilities, which seemed a long way back now. They had anticipated that it would afterwards be easier to carry on; but this had not been his experience. Instead of this, it had proved even more difficult than during war time. Another thing was the reorganization of the National Gas Council, which was particularly important. They in South Wales had assisted very materially in putting the parent body on a sound footing. He much appreciated their good wishes on his leaving the gas industry and going into a new line. As a matter of fact, he felt that he was not leaving the gas industry entirely, as he hoped on many occasions to be able to join the members of the Institution in their social gatherings, if not at the technical meetings. Any assistance he could at any time give to his old colleagues would, he could assure them, be most readily offered.

PRESIDENT'S ADDRESS.

Mr. BOND then proceeded to deliver the following Presidential Address; remarking that, as the programme was a full one, he had purposely kept down his remarks as closely as possible.

Gentlemen,—Once again allow me to express my sincere and best thanks for the honour you have conferred upon me in electing me as your President. It is an honour I can assure you I greatly appreciate; and although I cannot hope to attain to the high standard of many of my predecessors, I am sure I can count upon the support of the Council and members, also of our Secretary, Mr. Thomas. It will be my duty and pleasure to do all I possibly can to promote the interests of the Wales and Monmouthshire Institution.

This great privilege which has fallen to my lot during the first year of peace, will ever be remembered by me. The end of the terrible conflict was brought about by great and noble sacrifice and devotion to duty by the nation as a whole, and of our allies—convinced that they were fighting for a just cause of right against might. And now, to use the words of our Prime Minister, we must have done with the old world and begin a new one.

The gas industry during the war was called upon at very short notice to provide the necessary material for high explosives; and this involved much care and anxiety to managers in devising ways and means of erecting plant for the purpose required. In gas-works of small capacity no less than in those of larger size, this was undertaken not with a view to pecuniary reward, but in order to save our country from the enemy. By so doing we have only touched the fringe of many a subject of bye-products in the industry which we are all anxious to pursue further; and it now devolves upon us all to profit by the experience gained, and to lay ourselves out for improving and developing our resources in every direction.

You will remember the difficulty which confronted us when we were not allowed to dispose of crude tar excepting to distillers under a permit of the Ministry of Munitions. To overcome this, I advised my Committee to erect a small dehydrating plant, and permission was given me to proceed with the work. This was done at only small cost compared with that of the usual makers' prices; and in a short time we were able to supply dehydrated tar for works purposes where it was used for mixing dolomite used in the furnaces of steel works. The plant has now been in use for over three years, and answers the purpose admirably. The works referred to now specify dehydrated tar in preference to the crude, previously applied.

We also set up a small plant for oil-washing and the extraction of crude benzol, which was worked with more or less success—the difficulties being attributed to the nature of the creosote setting up an emulsion, and the wrought tube of which the steam coil in the still was composed being soon eaten away. Experience proved that cast-iron pipes were superior and gave no further trouble.

Oil-washing has now been discontinued, as the necessity for benzol extraction for explosive purposes is over. But this branch of the industry should not be put aside, as the production of benzol is now most important in order to meet the requirements of motor traffic.

These things go to prove how very necessary research work is, so that we may keep in touch with new methods and modern ideas of gas manufacture on scientific lines, and particularly the recovery of bye-products which we know has been so sadly neglected in this country in past years. This work I suggest should be the aim of the large gas-works, which usually have a staff of chemists and technical apparatus necessary for experimental work, or by men of practical experience in the various phases of gas manufacture—particularly in bye-products; for these are now more valuable than ever, with the enhanced price of coal. I trust that we may all do everything that is required to foster this.

The work of the Fuel Research Board is a step in the right direction; and although we may not agree entirely with the report and recommendations recently issued, it will no doubt have the effect of placing the industry in a far better position to develop upon scientific lines. For a great many years, gas undertakings have been seriously handicapped by the parliamentary limitations that have been imposed upon them, whether they are municipal or public companies.

The recent large increase in the price of coal by 6s. per ton has created another burden upon all gas undertakings. The importance of a cleaner coal for gas making in South Wales cannot be too strongly emphasized. The extra charge of 2s. 6d. per ton in this district cannot be justified, unless it is a charge for the large quantity of dirt included in the tonnage. In many cases I have found as much as 10 p.ct. of ash in coal, and sometimes 15 to 20 p.ct. The extra 2s. 6d. per ton, together with the dirty coal, if removed, would considerably lighten the burden financially, and enable us to keep-down the price of gas as low as possible.

It has now become a serious matter with us, how the increased cost of materials and labour will effect the output of gas. With the heavy cost, it is a vital question how we are to meet the demand for gas in the housing schemes which are now before the

country. The method so much in favour everywhere throughout the country, of free slot-meter installations with fittings and a gas cooker, is for the present almost prohibitive in price—being about two-and-a-half times more than pre-war; yet we must not neglect this opportunity of pushing the claims of gas. New buildings will furnish us with the opportunity of demonstrating the utility of gas-fires, from the view of cleanliness, and their adaptation to all the requirements of a modern dwelling, including hot water supply and lighting. I think it should be the aim of all gas engineers to encourage as far as possible a system of heating by hot water by the use of a gas-fired boiler, instead of a coal-fired one. I do not suggest that it would be practicable in all cases; but I believe a lot more could be done in this way.

We must also move on in modern methods of coal carbonization. In small works we are not able to afford a water-gas plant; but the recent introduction of a system of steaming horizontal retorts indicates that we may hope for some assistance in this direction, and thereby increase the make of gas per ton of coal carbonized.

For some time in this district, we have been considering the possibility of linking-up the mains of three or more works of small size, and laying-down plant and machinery in one or more works sufficient to meet the requirements of the whole. Under this scheme, we believe that considerable economies can be effected. It has also been suggested that we may avail ourselves of a gas supply from a large coke-oven plant erected near here, but not yet in operation. Whether or not either of these schemes will materialize will depend upon the attitude taken up by the several local authorities concerned. To carry on a number of small works in towns adjoining each other was not an ideal system of economy in pre-war days, and now it is even less so.

The system of hand-charging retorts in these days is a costly process; and any method of carbonizing coal with the use of machinery instead of hand-charging, must lead to economy, and so merits our earnest consideration. I think it is the duty of managers, apart from the question of cost, to reduce as far as possible the arduous labour involved in hand-stoking.

In the works of the Aberavon Corporation, we were fortunate in placing, in the latter part of 1914, an order for machine-stoking plant which was put into operation in June, 1915. During the war our output has been about 50 millions per annum; but the machine is capable of dealing with at least 100 millions with the same number of men. This quantity would have been sufficient for this and the adjoining town of Port Talbot; but just as war broke out they erected a works of their own.

One question which is becoming a serious item of expenditure in works of 50 millions or over is where steam is used for working exhausters, pumps, &c. In labour alone, under the eight-hour shift system, it involves the employment of three men, and in wages amounts to what in years past covered the wages of all the men on the works. In works of 100 millions or more the cost per 1000 c.ft. is, of course, not so much; but it is evident some steps are necessary to reduce costs in works of smaller size.

The question may be asked, Why not adopt gas-engines for this purpose? A gas-engine for exhausters in works of this capacity is no doubt all that is necessary; but where machine stoking is in use, then a separate engine would be required. It may be argued that steam is useful and necessary where sulphate of ammonia is produced, and for other purposes—especially in winter time, in case of frost. These are items which are becoming more important with the increased cost of labour.

Super-stations in the eyes of our rivals for power and light are now very much to the front; and I am persuaded that managers of gas-works, if progress is to be made, must take up the idea. We may hope that the report on the investigations of the Fuel Research Board will shortly give us their suggestions, and that the Government will recognize the good service rendered by the gas industry to the whole country during the war, and at least afford us equal opportunities of proving that, if coal conservation and economy can be effected, we are still able, in the future as in the past, to render them the best possible service.

We have at least learned some good lessons from the war—one being that our supplies of monazite sand, so necessary for the manufacture of incandescent mantles, are no longer monopolized by Germany. This no doubt will be conducive to the production of better mantles in this country, and thereby give our consumers more satisfaction. I hope greater care will be taken to prevent inferior burners being imported; for in the past this has brought discredit on gas lighting.

The National Gas Council (which as an organization is the outcome of various institutions) has done much useful service during the year, and is already proving its value. I have no doubt that if the District Councils keep up an active interest in the work, still greater progress will be made in the future.

These are a few remarks thrown out as to our present and future positions, and upon them I shall be pleased to have your observations, as any suggestion with a view to meeting the difficulties which are now daily before us will, I have no doubt, be of interest to all present.

THE PERCENTAGE OF ASH IN COAL.

Mr. CLARRY, proposing a vote of thanks to the President, said that addresses as a rule were more or less of a formal character; but they entailed a considerable amount of work in the collaborating of information. He would like to make one observation on the ash-content of coal. If the figures given in the address had been his own experience, he would have regarded himself as fortunate. ["Hear, hear."] In Swansea, they had been testing a truck of coal every day—though not from the same colliery—and they had found in some cases as much as 35 p.ct. of ash. If he were to give an average generally, it would probably be in the neighbourhood of 18 p.ct. If they considered the question urgent with 14 p.ct., he was sure they would have the support of all the members in trying to improve the position.

GAS FOR INDUSTRIAL PURPOSES.

There were also some remarks in the address about coke-oven gas. He (Mr. Clarry) had particularly interested himself in this subject during the past year or two; and he had come to the conclusion that the only way in which the smaller undertakings first, and the larger ones ultimately, could hope to hold their own against competition would be by uniting and amalgamating. It would come to this in future—that gas-works would be compelled to take any gas that could be utilized for industrial purposes. The Fuel Research Board recommended a dual supply of gas where it might be found efficacious. If the gas industry were to maintain their supremacy, they must supply gas, not only for domestic uses, but for industrial purposes as well. This was the only way, in his view, by which they could maintain the supremacy of gas. Undoubtedly, the industry of this country was dependent upon fuel. Their view—and it would become the national view in time—was that the ideal fuel was gas, not necessarily town gas, but fuel in gaseous form. The proper people to supply fuel in gaseous form were the gas engineers; and they should look round and find out the best means of doing so.

ELECTRICAL COMPETITION.

Mr. J. MOGFORD (Briton Ferry) seconded the vote of thanks to the President, and said the address was that of a man of considerable experience. He had been a neighbour of Mr. Bond for some eighteen or twenty years; and during this time they had on many occasions discussed matters together. Looking back over these years, the early part of the period seemed now like the recollection of a bad dream. He, in his little town four miles away, was struggling with inadequate plant, doing the best he could to produce gas that would burn, and to sell it at a price that would hold their electrical competitors at bay; while Mr. Bond at the same time was struggling along with a works very much worse than his own. He could remember when the output was hardly meeting the demand; when the purifiers would blow if one looked at them, and would blow worse if one did not; when the holder capacity was somewhere about three or four hours' demand, and it was a matter of counting rivets. After a man had "gone through the mill" in this way, he was surely in a position to read an address which would prove useful to his fellow-members; and Mr. Bond had gone through it, and come out of his difficulties successfully, and had built a works which they would all agree was one of the best-fitted in the Principality. One matter touched upon in the address was the labour trouble and labour costs which were added to a small concern where steam-driven exhausters were installed. For many years his (Mr. Mogford's) exhausters had been driven by gas-engines; and he failed to understand why small works did not generally adopt this method. He had very little difficulty in keeping them running with a gas-engine. There were troubles at times; but when all things were taken into account, he thought small works should adopt gas-driven exhausters as a matter of business. If they could not themselves use the motors they advocated other people using, it was a very poor advertisement. For the last few years, he had had as a stand-by an electric motor off the town cables. Possibly the majority of the members would not care for this; but he was in the position of having charge of the gas and electricity undertakings, and he had to confess that an electric motor was a very handy stand-by. Another matter on which he would like to say a word was the linking-up of neighbouring works. This had been a pet theme of his for some fifteen years; and he agreed with Mr. Clarry in what he had said. In fact, it was just what he himself had been advocating. To his mind, the cock-pit of the competition between the super-electric station and the gas industry was going to be in South Wales. The old Power Company had put down stations; and they were going to be linked-up with superior and larger stations. They would be connected-up with the big steel plants that were now being put down in the district; and unless the local authorities looked to it and linked-up and centralized their gas undertakings, there was no question that, in this industrial area, the gas industry would go to the wall. This would be a loss to the district and a loss to the nation, because there could be no question that, if they were to have coal conservation, this could only be accomplished by carbonizing; and gas engineers were the proper people to carbonize coal, and the people who had been accustomed to do it for generations. Some time ago, the members visited a very large new works in the adjoining district—those owned by Messrs. Baldwins, Ltd.; and to-day they saw them putting up their coke-oven plant—a plant which would be able to supply more gas than all the neighbouring gas authorities were now producing. But instead of this gas being distributed, as it should be distributed, in gaseous form, it was going to be converted into electricity, and for this purpose a large electrical station was to be put down. The distributing cables were now being laid—miles of them. So, if it was not already too late, it was high time for the whole of the gas industry in the district to be making a move to adopt the recommendations of the Fuel Research Board—though possibly not with the restrictions which the Board now proposed. Broadly speaking, the report of the Board was the only possible means of saving the gas industry in their area, and of conserving coal for the nation.

The vote having been heartily passed,

The PRESIDENT, in acknowledgment, remarked that he had purposely inserted a few remarks to create discussion on points which particularly applied to Glamorganshire. He was convinced that they had to seriously consider what they were going to do at the present juncture. There were vertical retorts; and no doubt these were a great advance on the older systems. But they had to meet the question of whether they should put down plant themselves or adopt the suggestion that was now being thrown out, of utilizing the coke-oven gas which was available for them. He quite agreed that gas engineers were the people who should still retain the business. The coke-oven and bye-products industry had copied to a very large extent what they

themselves had been doing for many years. They ought to be able to get this gas at a very much lower price than, with the increased cost of production to-day, they could make it at themselves.

The Special Purposes Section.

The ninth annual report of the Special Purposes Section, which was then submitted, stated that one authority had joined during the year, making a total membership of 32. The serious position in which local gas undertakings had been placed through the large increase in the price of coal imposed by the Price of Coal (Limitation) Act had received considerable attention; and everything possible had been done in the matter, but unfortunately with no beneficial results. During the year the National Gas Council had been reformed, and 36 local gas undertakings had joined. Good work had been done; and it was hoped the undertakings that had not yet joined would do so, in order that they might present a united front in these serious times. It had been decided to continue the work of the section; the meetings to be held on the same day as those of the District Executive Board of the National Gas Council.

Mr. T. H. HAZELL (Newport), moving the adoption of the report, said it showed that matters of vital interest to the gas industry had been dealt with during the year. Perhaps the most important part of the report was the announcement that it had been decided to continue the section. As they were aware, it had been suggested that, now there was a District Board of the National Gas Council, all the work that was necessary could be done by the Council, and the Special Purposes Section might accordingly be discontinued. He thought, however, it was a wise decision to continue it, because in this way many matters of interest to the industry could be more intimately considered than they could perhaps be at the general meetings of the Board of the National Gas Council. For instance, supplies and prices obtainable for coke and tar were questions which could be much better discussed by the Special Purposes Section. He was very glad that the President had alluded to the extra 2s. 6d. per ton for coal imposed upon the whole of the district. This was a matter that should be referred to on every possible occasion, so that the industry generally and those in authority in London should always remember that South Wales was under a special penalty in this respect. Then they might hope that at some time or another reason might dawn upon the "powers that be," and the 2s. 6d. per ton be removed. Of course, the 6s. per ton was a bombshell to them, from which they had not yet recovered. It was satisfactory to know that the National Gas Council had been, not reformed, but re-formed. It bid fair to be a power in the land. It was time that the industry acted in combination, so as to bring about much better results than it had been possible to attain acting singly. Generally speaking in the financial world the disastrous effect upon statutory undertakings of the war and of the increase in costs which it had brought about had not been realized. In ordinary commerce, when an extra charge had to be borne by an industry, it entered into the general costs, and was passed on to the consumer. The public did not seem to understand that statutory gas concerns were fettered, and could not do justice to their undertakings unless some measure of relief were granted to them. The trouble was one from which some means of escape must be found. There was little chance of the gas industry getting any more money until the subject had been thoroughly considered and Parliament had been convinced, through the National Gas Council and the Board of Trade, of the necessity of giving relief from the burdens that had been placed upon the industry. He hoped this would very soon be accomplished.

Mr. F. SHEWRING (Pontardawe) seconded the adoption of the report; and it was agreed to.

Representative on the Institution Council.

Mr. KENSHOLE, proposing that Mr. Bond be elected to represent them on the Institution of Gas Engineers Council for the ensuing year, said it had hitherto invariably been the rule that the retiring President should be appointed their representative. But as Mr. Clarry was leaving the profession, it had been felt that it would be unfair to expect him to devote the time necessary to attend meetings in London. Further than this, there had long been a feeling that the Institution was rather behind the times in this respect, and that it would be better for the President to occupy the position referred to.

Mr. CLARRY seconded, and agreed that it was a fitting opportunity to inaugurate an improved procedure—that of appointing the President to represent them during his year of office.

The proposal was agreed to.

Office Organization.

Mr. W. C. JACKSON (Neath) then read a paper on "Office Organization." This, with a report of the discussion, will appear later.

The author was cordially thanked, on the proposition of Mr. J. ROBB (Chepstow), seconded by Mr. F. C. WHITE (Blaenavon).

The Corporation Thanked.

On the proposition of Mr. JACKSON, seconded by Mr. S. MURRAY (Aberkenfig), the Mayor and Corporation of Aberavon were thanked for lending the Council Chamber in which to hold the meeting.

Place of Next Meeting.

It was agreed, on the motion of Mr. MOGFORD, seconded by Mr. JACKSON, that it be left with the Council to decide upon the place of next meeting.

This brought the business to a close; and the visitors were then taken by motor (which the President had thoughtfully arranged for) to the beach, and afterwards to the gas-works.

The Aberavon Gas Undertaking.

The present gas-works of the Aberavon Corporation were built for an output of 60 million c.ft. of gas per annum. They were erected in 1907 (to the designs of Messrs. Thomas Newbigging and Son, under the superintendence of Mr. Bond), at a cost of £11,300, on a new site of about 2½ acres which had been acquired some ten years earlier, and on which there had already been constructed a gasholder of 125,000 c.ft. capacity, in steel tank. The works, on to which private sidings run from the Rhondda and Swansea Bay Railway, are situated at the lower end of the town, which is now being rapidly developed.

The retort-house is 60 ft. by 62 ft., fitted with four through benches of six horizontal Ω-shaped retorts 20 ft. long, some 24 in. by 16 in. and others 21 in. by 15 in., with furnaces on the regenerative system. The house is fully equipped with Drakes stoking machinery, operated by electric power generated by means of a 25 H.P. high-speed steam-engine, 630 R.P.M., 25 KW., by Browett, Lindley, & Co. The machine consists of a pusher for discharging the retorts, and a charger capable of putting in a charge of 14 cwt. in 21 seconds. The coal-handling installation includes a breaker, elevator, and push-plate conveyor.

The condensers are of the annular type, with a capacity of 250,000 c.ft. per diem. There are two exhausters—one by the Bryan Donkin Company, the other by Messrs. Waller & Son—the capacities being 10,000 c.ft. and 5000 c.ft. per hour. The tower-scrubber is 60 ft. high and 6 ft. diameter, with washer at the base; and there is also a Livesey washer for tar extraction. There is a tar and liquor well, with the usual separators, 30 ft. diameter and 7 ft. deep. The purifiers consist of four boxes 14 ft. by 14 ft. by 5 ft., controlled by a Weck centre-valve, with two catch-boxes of similar size. For measuring the gas, there is a station-meter passing 15,000 c.ft. per hour, by Messrs. Parkinson and Cowan; and the town governor was provided by the same firm. Inward and outward haulage of wagons is accomplished by means of a capstan, geared up to a 10 H.P. motor. The members saw a small tar dehydrating plant, put up under war conditions by Mr. Bond, capable of dealing with 4 tons of tar per day. The old works have now been entirely dismantled; and the holder originally of 125,000 c.ft. capacity was in 1910 telescoped so as to contain 260,000 c.ft. of gas.

In 1911, the Margam Urban District Council promoted a Bill in Parliament, to enable them to become their own gas-supplying authority; and at the time their works were completed, three years later, the output of the Aberavon works—somewhere in the region of 50 p.ct. of which went to the Margam area—was 70 million c.ft. a year. It is now 54 millions, which represents since the separation a gain of about 17 million c.ft. a year. When Mr. Bond took charge of the undertaking in 1901, the concern had a capital of £25,000; and the price of gas was 4s. 6d. per 1000 c.ft. In 1914, when Margam separated from Aberavon, the price of gas was down to 3s. per 1000 c.ft. Mr. Bond prepared the figures and estimates for the Aberavon Corporation case in connection with the Margam Bill and the subsequent arbitration. As the result of the award, Margam paid compensation to Aberavon amounting to £30,840, which left the Aberavon Corporation practically free of debt on the gas undertaking.

Luncheon.

The party were then driven to the Walnut Tree Hotel, where they were the guests of the President at luncheon.

Mr. CLARRY (after the honouring of the Loyal Toast) proposed the health of the Mayor. He said that he did not think he had ever seen a little gas-works which was a neater and more model proposition than the one at Aberavon. He hoped the borough would attain its ambitions, and be successful in its future development.

Councillor WILLIAMS remarked that he much regretted the absence of the Mayor, who had fully intended being present. He (the speaker) wanted to take this opportunity of paying a tribute to their Engineer, Mr. Bond. The Corporation had been very fortunate indeed in having had him in their service for the past eighteen years. He himself had been a member of the Corporation for about sixteen years; and so they had been thrown together a good deal. He could tell them that great credit was due to Mr. Bond for the way in which the gas-works had been engineered. At one time they had a very dilapidated old works; and there was a great fight as to whether or not they should be scrapped. The old school thought it better to patch and patch; and the rates were always subsidizing the concern. Ultimately, however, it was decided to go in for a new works; and they had been a great success. If they had not taken this step, the financial situation of Aberavon would have been very much worse than was the case. In many recent financial years they had been able to make a profit of some £4000; but they had looked to the future. They wanted a larger output. The gas concern had a very low indebtedness to-day—only some £4000. They had a splendid property—a property with which, if the output was encouraged, they would be able to supply gas as cheaply as any authority in Wales. They regarded these undertakings from a purely business aspect. One thing in particular he would like to say was that the great success of their works came about when they introduced free installations, when they adopted the system of providing everything ready for gas to be used in the houses. At present about one-third of their output was through free installations. It was essential for the proper advertising of gas undertakings that every locality should have a show-room and a sales-room. They ought to encourage the use of gas; but unless they possessed these facilities, it was impossible to do so to the best advantage. It was a great pleasure to him to welcome the Institution to Aberavon, in the name of the Mayor and Corporation. Proceeding, he proposed "The Wales and Monmouthshire Institution," remarking that the members belonged to a noble profession. If they hoped to maintain their position, they would have to look to it. There were great problems ahead;

but he felt sure the Institution would be equal to grappling with them. He wished them all prosperity.

The PRESIDENT briefly responded to the toast.

AT THE DOCKS.

The members next proceeded to the docks, which were open for their inspection, by permission of Mr. Edward Lowther, the General Manager of the Port Talbot Railway and Docks Company, who placed a special train at their disposal. They were taken first to the Crown Preserved Coal Company's works on the other side of the docks; and afterwards they inspected a large belt conveyor for loading coal into ships.

The port is pre-eminently a coal-exporting one; and the appliances with which the docks are equipped are specially adapted for this purpose. Eight coal-hoists and three modern coal-conveyors have already been erected; and ample provision has been made for further facilities as required. The hoists, all of which are fitted with anti-breakage appliances, are capable of dealing with 600 tons per hour; and are worked on the high and low level system. As to the three conveyor belts, these are capable of shipping as much as 800 tons of coal per hour; so that where it is possible to employ two conveyors on one vessel, the shipping can proceed at the rate of 1600 tons per hour. This, as a matter of fact, is often done. One of the conveyors is of a movable type; and all have a maximum height above quay level of 60 ft., and can deal with wagons of 30 tons. The belt conveyors have been found very successful in working, and are specially suitable for middle sized coals and small. The export trade in 1899 was 253,000 tons; and by 1913 the figures had increased to 2,519,671 tons. During the war period, under Government control, the exports have fluctuated; but in 1916 they reached 2,622,354 tons.

The product of the Crown Preserved Coal Company is a patent fuel, the first trial machinery for which was erected more than half-a-century ago at Port Talbot. The fuel is made exclusively from the screenings of the best steam coal to be obtained in the Cardiff district, carefully washed, dried, and blended by the most modern appliances. The Company own extensive works at Cardiff and Port Talbot, making at their full capacity 3000 tons per day. Every block, it is stated, from the peculiarity of its manufacture, is practically hermetically sealed; so that the fuel can be relied upon for use in any climate. The cubic capacity of "Crown" fuel is about 33 ft. per ton, as compared with 45 ft. for coal. The Company make two sizes of blocks; the larger weighing about 24½ lbs. each, and the small ones 12½ lbs.

EFFICIENCY OF BOILERS AND POWER DISTRIBUTION FOR GAS-WORKS.

By W. H. POSTLETHWAITE.

[A Paper to be read at the next Meeting of the Manchester and District Junior Gas Association.]

Speaking generally, and without reference to any particular works, the generation and distribution of power in gas-works are done much less efficiently than in works devoted to manufacturing engineering. There is an ancient axiom, that "Profits are Made and Lost in the Retort-House." Profits may be made in the retort-house; but there are literally hundreds of little cracks in the organization of a works down which those precious and carefully nursed profits can vanish. It is my object to try to point out some of the cracks, and to suggest methods of stopping them.

On every works there is a boiler. In the sense that a boiler transforms the heat-energy of fuel into the heat-energy of steam, a boiler is a machine. What is the efficiency of the machine, and how can it be measured? There is a theoretical efficiency which, with present methods of working, it is quite impossible to reach. But under the best conditions, with heated feed-water, and superheated steam, the efficiency of a well-designed water-tube boiler, considered as a heat engine, is 70 p.ct. A Lancashire boiler, well fired and in good condition, will give a figure almost equal to this. The great advantage of a water-tube boiler is in the saving of floor-space effected by its use.

Imagine we have the usual works' boiler plant—say, for a medium-sized works, four Lancashire boilers about 30 ft. long and 7 ft. 6 in. in diameter. On most works, you will find these boilers working at low pressure, with natural draught, without economizers or superheaters. How can the efficiency of plant of this type be improved? In these days, money is "tight," and few companies or corporations are prepared to spend large sums of money for what may appear to them to be merely problematical advantages.

In the first place, find out what goes on in your boiler-house. All over the works you have pressure-gauges. Put a couple on the boiler-flues—one at the base of the chimney and the other in the side-flue of the boiler. Measure the water you use, and the fuel you burn, and keep a record of the steam pressure, preferably by a recording gauge. Note how often the fireman cleans the fire, and study the draught gauges. It is astonishing the difference a clean fire makes to the draught. On one occasion recently, I noticed that cleaning the fire increased the draught by 50 p.ct. Obviously, if the fire-bars are covered by masses of clinker, air cannot get through. It is as though the draught were pulling at a bottle. Have the fires cleaned often.

Again, estimate now and then the CO_2 in the flue gases. For large boiler plants it will be found expedient to instal a CO_2 recorder. There is no better index to the conditions of combustion in a boiler-furnace than the quantity of CO_2 in the flue gases.

Percentage of CO_2.		Percentage of Coal Wasted.	
4	..	32·4	Test on coal of 13,500 B.Th.U.
5	..	26·2	Gases 400° Fahr. at Exit.
6	..	21·8	
7	..	18·9	
9	..	14·9	
10	..	13·4	
11	..	12·3	
12	..	11·4	
13	..	10·6	[BOOTH & KERSHAW.]

The average high-water mark to aim for is 12 to 14 p.ct. of CO_2, though with one boiler plant I am acquainted with, when a CO_2 recorder was installed, it was found that the CO_2 was averaging about 5 or 6 p.ct. This was due to the firemen leaving the fire-door slightly open after firing, so as to burn the top coal quickly, and so give a deceptive appearance of good firing. This was stopped; and the percentage of CO_2 almost immediately rose to 12.

Practically, the whole success of boiler-house operation depends on good records being kept. Gas engineers, as a rule, do not bother about the coke burned under boilers. "There is plenty of it, and we get it for nothing; so why should we worry?" But there is another side to the question. Coke has a market value—a very good one at present; and every ton of coke saved is so much more to the credit side, for the ton could be sold. And this brings me to another point—viz., fuels. Most gas-works burn coke; some burn breeze; none, I think, as a regular practice, burn coal. The lower the grade of fuel that can be burned (having regard to keeping a good steam-pressure) the better it is for the boiler-room finances. It is quite impossible to burn breeze with natural draught; that may be taken as an axiom. The question then arises of artificial draught, which is it to be—forced or induced?

Induced draft apparatus is usually placed at or near the base of the chimney which serves a battery of boilers. As a rule, all the products of combustion pass through the apparatus (which is usually a fan); and it will be readily understood that under these conditions the life of the fan-blading is very short. I have known instances where fan-blading has not lasted six months; but the usual life averages two to three years. The chief disadvantage of induced draught is that it creates a partial vacuum in the boiler-flues, and so tends to draw in cold air through any cracks in the brickwork, thereby reducing the temperature.

Forced draught apparatus is usually placed at the boiler front, and so is something of an inconvenience—preventing free access to the fires. On the other hand, it can be applied to each furnace separately, and can be regulated at each fire, as required. Also, the boiler flues are under pressure; and flue gases are apt to be blown out through imperfections in the setting, which tends to less loss of heat than when cold air is drawn in.

Induced draught apparatus is usually placed at the chimney end of the boiler, and so is out of the way of the fireman. It is ordinarily a cooler place than the firing-floor, and so it can be more easily inspected and repaired. In most induced draught systems, all the products of combustion pass through the fan. This is a great disadvantage, as it tends to rapid corrosion of the fan-blading, both by deterioration in the metal, owing to the heat, and from the cutting action of the flue dust. Trouble is also liable to occur through overheating of the fan-bearings by heat conducted along the fan-shaft. Fan-bearings for this type of work are often water-jacketed, and the temperature kept down by this means.

The ideal method of burning coke-breeze is by means of a mechanical stoker; and the types of mechanical stokers are legion. Perhaps the best one for breeze would be a chain-grate type. In this type, the fuel is fed from an overhead hopper on to the front of a moving grate, and carried forward into the boiler furnace. The amount of fuel placed on the grate and the rate at which the grate travels are both adjustable at the boiler-front, and can be varied to suit any particular set of conditions. Of course, a mechanical stoker designed to use coal cannot be put on coke, as coke has no flame; and as the heating area is confined almost to the grate area, the grate area must be increased.

Boiler repair hardly comes within the ken of the ordinary works engineer. As a rule, the boilers are inspected by an Insurance Company; and any repairs they advise are carried out by an outside firm, and not by the works repair staff.

The feed-water should be subjected to analysis regularly, and the results tabulated, so that any change in composition can be readily seen. In this respect, gas-works are favourably placed. Most works have a laboratory, and someone in charge capable of making the necessary tests, which can be quite simple.

There are two other adjuncts to the boiler-house which go a long way towards economy—viz., the feed-water heater or economizer and the superheater. Both these appliances are worked by the waste heat from the boiler-fires, and so are a very direct method of conserving heat units. The economizer consists of a set of tubes placed in the main flue serving a battery of boilers, near the outlet to the chimney. Through the tubes passes the feed-water on its way to the boilers and round the outside of the tubes circulate the hot gases from the boiler-fires. An economizer

in good condition will easily raise the temperature of the feed-water 200° Fahr. If, therefore, we know the quantity of water that is passing through the economizer we can calculate (almost instantly) the number of heat units we have saved.

The points to be watched about an economizer are that the scrapers are doing their work properly, and that the inside of the tubes is kept clear of scale. Since the first heating of the water takes place in the economizer, it follows that all the deposit due to temporary hardness forms there. It is sometimes argued that an economizer obstructs the chimney draught, and by cooling the gases before they enter the chimney, lower its efficiency. Theoretically, of course, this is possible; but in actual practice it is infinitesimal.

The superheater is, as a rule, placed immediately at the end of the boiler; and so it encounters the gases at the moment of the exit from the boiler-flues. It consists of an arrangement of tubes, through which steam passes on its way from the boiler to the steam-main. Its function is to add heat to the steam, over and above that due to the boiler-pressure. Hence the name, superheater. The chief advantages of superheated steam are its dryness (as any globules of moisture which may be mechanically carried along by the rush of steam will be vaporized), and its non-liability to condensation in long lengths of steam-main. As most gas-works steam-plant works at very low pressure, the economy of superheating will bulk fairly large.

Now, how are all these points to be watched? It is fairly easy to walk round and instruct the firemen to keep their fires clean, not to overload them with cold fuel, and see that they do not burn thin and let the air through. The CO_2 recorder has been mentioned. That will do for one watch dog. But the thing to do, in order to be certain that proper results are being obtained in the boiler-house, is to keep continuous records of all the things that really matter.

The weight of fuel burned, and the quantity of water evaporated, give at a glance the overall efficiency of the plant; and this should be taken constantly, and worked out. If this is done every week, a good idea can be formed of how things are keeping, and any falling off investigated and put right. The temperature of the feed water, and the temperature of the waste gases should be noted every day; also some attempt should be made to find out the heat lost in the ashes, and whether any fuel is being wasted through careless clinkering.

The efficiency of the boiler-house depends on the proper keeping of records. How many gas-works boiler plants have even a water-meter installed, to measure the amount of water supplied to the boilers, and consequently evaporated? If I said 5 p.ct., I should think it was putting it high. In how many works are any records kept of boiler-house performance? Very few, indeed. And yet it is well worth while to keep these records. Economies may be effected, running into hundreds of pounds in a year, depending on the size of the works. A certain number of heat units are supplied to the boiler-house. What becomes of them? They cost money; and anything that costs money in these days is well worth looking after.

PRIME MOVERS.

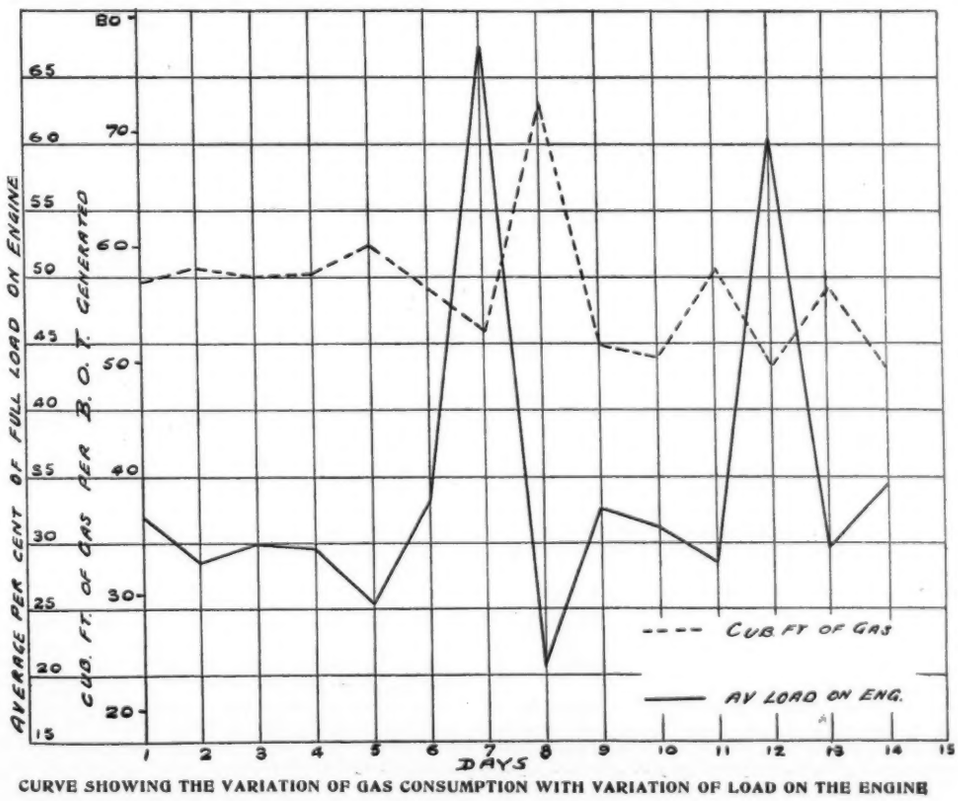
The prime mover most in favour on gas-works is the reciprocating steam-engine—usually non-condensing. It is a beautiful arrangement, delightfully simple, and it usually gives the lowest result for the highest expenditure of fuel. But consider it for a moment. There is the boiler, the steam pipe, and the engine. The boiler and the engine are often widely separated. This condition is nearly always inevitable, and it has to be made the best of. The sources of loss in a lay-out of this nature are: (*a*) Condensation in the steam-pipe; (*b*) losses by condensation and radiation in the engine; (*c*) heat lost in the exhaust steam.

(*a*) May be remedied by improving the lagging on the steam-pipe, and superheating the steam. (*b*) Apply here the same remedies as for (*a*). (*c*) This is the main loss. The obvious remedy is to: (1) arrange for the engine to exhaust into a vacuum, and (2) collect the exhaust steam and utilize it. Collecting the exhaust steam and utilizing it may sound rather fantastic, but it is a method of obtaining economies which has been in use for many years.

The arrangement roughly is this. Light, mild-steel exhaust steam-pipes are run to some convenient place. The steam is led through a separator, which also acts as a heat accumulator, and into an exhaust or mixed pressure steam-turbine. From there, it passes into a condenser. By this means, the last fraction of energy is extracted from the steam, and one may be quite sure that, when finished with, the steam is of no use to anyone else. I regret not to have been able to obtain any very definite figures on this point; but I am acquainted with a works' plant in which the exhaust steam was, by this means, made to give up approximately 150 H.P., which had before been allowed to escape into the air. To deliver 150 H.P. at the engine-shaft requires about 265 lbs. of average coke per hour. The saving in this case is obvious; for if the plant was running for 44 hours a week, it would mean a saving of say 5¼ tons of coke per week.

Steam turbines are not as yet in general use in gas-works practice. But when new plant is to be installed, it is a point worth considering whether a turbine could not be used. There would seem to be an obvious field in the driving of rotary exhausters. Here you have a case where a steady turning effort is desirable; and this is the special feature of a turbine. Again—power for power—a turbine requires much less floor-space than a reciprocating engine; and the foundations do not need to be so substantial, as the revolving rotor is perfectly balanced. The speed need not offer any difficulty, as geared turbines have been made for some years, and have (due to improved methods of designing and cutting gears) given every satisfaction.

The gas-engine as a prime mover not unnaturally is much in favour with most gas engineers. It is a preference that is easily understandable. As a means of utilizing heat energy, the gas engine is about twice as efficient as a steam-engine, calculating the efficiency from the fuel to the engine shaft. The gas-engine, however, has several limitations. It is not universally applicable; it will not carry an overload; and the engine frame is subject to heavy and alternating stresses. Further, on fluctuating loads, its efficiency varies very considerably as the accompanying diagram shows. At the same time, when the conditions are such as suit its peculiar genus, the gas-engine is very satisfactory indeed For economical running the load should be fairly constant; and if



CURVE SHOWING THE VARIATION OF GAS CONSUMPTION WITH VARIATION OF LOAD ON THE ENGINE

it is desired to avoid trouble, see that the foundations are solid, and that the foundation bolts do not work loose.

POWER DISTRIBUTION.

Under this head, I shall consider only such methods as may be advantageously used over moderate distances, and excluding belts, ropes, and gearing. The most usual method employed in gas-works practice is the steam-pipe, which is admirable in its place, and for work suited to its peculiarities. But the most cursory thought will show that, as a means for transmitting small quantities of power over distances of (say) 50 to 200 yards, it leaves much to be desired. It is wasteful, as the necessary provision of draining arrangements and steam-traps sufficiently indicates. All water drained from a steam-pipe, is water which has been evaporated in the boiler, at a cost of considerable fuel and trouble, and which causes renewed trouble and expense in its removal. There are other charges to bring against the steam-pipe. Its weight renders substantial supports necessary. A pipe-line is usually built up of 9 ft. lengths of cast-iron piping, so that in 75 yards there will be at least twenty-five joints. Each joint is a possible source of waste by leakage; and there is always the possibility of a joint-ring blowing-out.

Another method of power distribution is by compressed air. Almost all the objections brought against steam hold in this case, with the sole exception of condensation. There is also the added difficulty that leakage at a joint in a compressed-air pipe is not visible, as in the case of steam. Air compressors are fairly efficient; but the machines are not which utilize compressed air to produce motion. A test I made some years ago on this class of machinery, showed some astonishing results. The test taken was an overall test—that is to say, the power delivered at the point of application was compared with the power required to drive the compressor. This arrangement showed the efficiency of compressed air driving to be not more than about 5 p.ct.

Compressed air is not in very general use; its chief application for gas-works being the driving of certain types of stoking machinery, and occasionally the driving of a portable drill.

Power is frequently transmitted by means of water under pressure. Here, again, a pipe-line is required, with the disadvantages of great weight, owing to the strength of pipe rendered necessary by the high pressure (750 lbs. per square inch being a usual pressure) and the trouble of numerous joints. Further, there is some additional complication. Owing to the incompressibility of water, an accumulator has to be used; and this is a frequent source of trouble. Again, whatever load there is on a hydraulically operated machine, the power used is always the same. If you have a wagon hoist, unless the rams are duplicated, it takes just as much power to lift the table of the hoist empty as with a 20-ton wagon of coal on board. This is a wofully wasteful method.

There is one other method of power distribution which I almost tremble to mention in the presence of a company of gas engineers —and that is electricity. Some engineers, I am told, refuse to have the hated thing (whatever its nature may be) within their works. It is much to be regretted that they take up this attitude. Electricity is, in many ways, singularly convenient; and for the efficiency with which it will transmit power from point to point it is unequalled.

Many modern types of stoking machinery are electrically driven; and if it was not for the facility with which the speed of a motor can be varied, some types of stoking machinery would be either impossible, or so complicated as to be unwieldy.

As a method of transmitting power, it offers great and undeniable advantages. Cables are much lighter than steam-pipes; and they can be run in racks on walls, or over roofs, or carried on poles. There is no trouble from condensation, joint-rings blowing out, or any other of the nnmerous ills that steam-pipes are heir to. If the cabling is well thought-out, of good capacity, and carefully run, one can forget about it for years at a time; and there is no other system of power distribution of which this can be said. I do not hold any brief for the electrical people; but when there is something we can use to our own advantage, by all means let us do so.

We cannot live or progress by knocking holes in the accepted order of things. Reconstruction is in the air at all events, though it does not yet seem to have materialized in bricks and mortar. Let us do a little reconstruction. If gas engineers ever pause in the fascinating pastime they are so fond of—"chasing the make"—to consider in any broad sense the shortcomings of their works, they will admit that in the organization for dealing with the production, distribution, and utilization of power, there is room for great improvement. The means by which power is supplied to the various necessary points about a gas-works, is worthy of considerable thought. A unified scheme, carefully planned, with provision for extensions, is rare. In most cases, it is quite impossible to obtain any data indicative of the efficiency of the plant. This should not be.

Every works of more than moderate size, should have a central power plant. And here my heresy comes to the surface. I would suggest a central station, to generate electricity for use all over the works, wherever it can be used with advantage. The power plant would consist of boilers fired with breeze, or any other low-grade fuel available.

Under these conditions, all the devices for increasing boiler efficiency could be used with advantage, and a close watch could be kept on their performance. Adjoining the boiler-house would be the engine-room, with turbines—preferably of the disc type—driving electric generators. From the switch-board in the engine-room, would radiate the power lines to the retort-house, purifier-house, exhauster-house, pumps, and all the other hundred-and-one devices where motion is needed. An arrangement such as this, lends itself to keen observation and control; and there could be no excuse for ignorance as to the exact performance of any portion of the plant.

WASTE HEAT FROM RETORT-SETTINGS.

There is another method of steam-raising which might be applied in gas-works, but which so far as I am aware, has not yet been made use of in our industry. That is the utilization of the waste heat from the retort-settings. Some of this heat is made use of in regenerative settings; but there is a very large quantity which is lost up the chimney. It should be possible to instal waste-heat boilers, to be heated by the flue-gases, and which would supply all the power needed by the works.

It will be instantly objected that such boilers would impede the draught. This would readily be overcome by the provision of an induced-draught fan. Something of this nature is done in connection with a battery of boilers by installing economizers; and it is probable the design of waste-heat boilers would follow on these lines. It would be a water-tube boiler, since all the heat has to be conveyed to the water by conduction, and not (as in normal boilers) largely by radiation. Care would also have to be taken that the gases were not cooled too far; as that would result in the deposition of moisture and the consequent rapid corrosion by the acids—the SO_2 and CO_2—contained in the gases. Boilers of this type are I understand employed in the metallurgical industries, with handsome results. On the face of it, there does not seem to be any valid reason why we should not do the same, and reap similar rewards.

PLANT MAINTENANCE.

In conclusion, I should like to offer a few remarks on plant maintenance. The secret of efficiency and freedom from breakdowns in any plant is inspection—keen, continuous, and systematic—by an inspector who is skilled and has that peculiar nameless faculty, the "art of getting things done." Inspection by itself is useless, however, unless it is followed up by a competent staff of mechanics, and everything put right or adjusted as reported upon. The mechanics themselves, as their headquarters, should have a well fitted-up shop, where all engineering operations could be carried out. Some form of power hammer is a necessity, as many operations of plate bending, &c., cannot be carried out without it.

Along with the system of inspection, there should be carried out a system of records, arranged on the "card" system, with a card for each machine. In addition to the cards, details of the repair should be entered in a "Plant Log-Book," in which should be stated briefly the cause of the trouble, the steps taken to rectify it, and the length of time the machine was out of action. A glance at the card will show which member of the machine is most subject to breakdowns, and also (a matter of importance) the name of the attendant in charge at the time. If any attendant shows a large proportion of breakdowns compared with others, he could be taken to task about it, and educated into better methods.

There is one other item which concerns the well-being of a works plant, particularly in the matter of keeping up to date—viz., depreciation. This is a financial matter and so is somewhat outside the range of our subject. But it is one of the most important when regard is had to the necessity of constant change or renewal. A rate of 5 p.ct. is often allowed; and this would permit the renewal of the plant every twenty years. But a higher rate, with correspondingly earlier renewal, would be more advantageous. The advantage of a depreciation fund is realized when (due to the advance of science) some new device is to be installed and an old one scrapped. Then the engineer who is well provided in this respect is a happy man; while his colleague who is unprovided wonders how it is done.

Society of British Gas Industries.—The autumn general meeting of the Society will be held at the Midland Grand Hotel, St. Pancras, on Thursday, Oct. 30. The programme of arrangements will be announced later.

Eastern Counties' Association Meeting Postponed.—In view of the uncertainty of the situation, inquiry was made yesterday of Mr. F. M. Paternoster, the Hon. Secretary, as to the holding tomorrow of the meeting in London of the Eastern Counties Gas Managers' Association. The telegram received in reply says: "Meeting indefinitely postponed unless strike settled."

New Coal Mines in Belgium.—According to the "Journal des Usines à Gaz" of Sept. 5, the Société la Vieille Montagne announces the discovery in the neighbourhood of Aubin, at about 420 ft. depth, of a rich 30-feet seam of coal. This is the first result of searches which began in 1905. Another new source of supply is being developed near Hasselt (Belgium), where sinking operations were in progress at the outbreak of hostilities. A good number of French companies—Schneider, Marine-Homécourt, Micheville, Pont-à-Mousson, &c.—have interests in the district. According to the report of the Chief Mining Engineer of the Liège, the sinking operations suffered little from the enemy occupation, and some of them could even be continued. The yearly capacity of this source, when in full working order, is estimated at 15 million tons.

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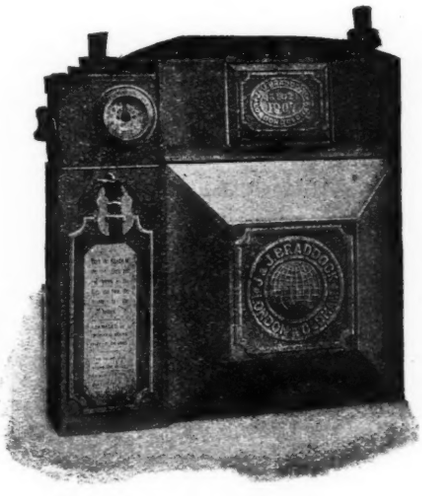

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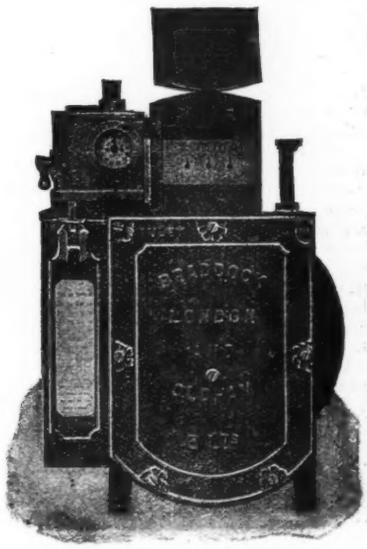

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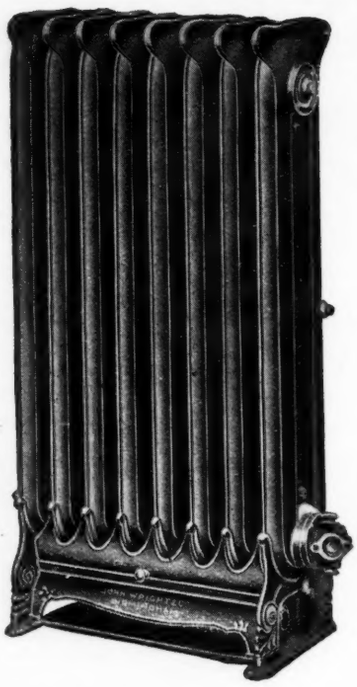

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Gas and the Housing Scheme

I beg to acknowledge receipt of your favour of the 17th inst. enclosing copy of "Gas and Housing Scheme". Allow me to tender my congratulations to you on the preparation and publication of such a tasteful, concise and helpful presentment of the case for gas in connection with proposed Housing Schemes.

I am obliged for your letter of the 14th inst. re Housing Schemes, enclosing Booklet, and must compliment you on the attractive way in which it has been compiled and it will no doubt be of great service in promoting the use of gas.

..... I congratulate you heartily on your enterprise and the excellent publication you have produced.

..... "Gas and the Housing Scheme", which I shall read with very great interest and which from a preliminary glance would appear to be a valuable addition to our means for keeping gas to the forefront.

I like the format and contents of the Publication and it should be helpful alike to the Industry and the Public we serve.

Expressions of appreciation continue to reach us regarding "Gas and the Housing Scheme." This comprehensive illustrated Book, which has been specially compiled for handing to Architects, Local Authorities, Builders, and all who are interested in Housing in your district, contains full details of alternative schemes for Cooking, complete Hot Water supply, Heating, &c., and gives working and installation costs. If you have not yet advised us of your requirements please write for supplies.

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MISCELLANEOUS NEWS.

GAS CHARGES IN THE METROPOLIS.

Protest by the City Corporation.

At the Meeting of the Court of Common Council of the City of London last Thursday week, the Streets Committee reported the receipt of a letter from the Gas Light and Coke Company, forwarding a notice of their application to the Board of Trade for an Order under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, and intimating that an application had been made to the Board for permission to raise the price of gas to 4s. 8d. per 1000 c.ft. as from the meter readings this month. In December last, the Board of Trade made an Order whereby the rate of dividend which the Company might pay on their ordinary stock should not depend, as heretofore, on the price charged for gas, provided the dividend should not exceed 3 p.ct., and the price should not exceed 4s. 4d. per 1000 c.ft. unless subsequently varied by the Board.

The clauses in the Order securing the limitation of the price and the certification of the accounts by an independent accountant before the payment of dividends, were obtained by the action of the Streets Committee.

The Gas Light and Coke Company now asked for an Order in substitution of the 1918 Order, to provide that the rates of dividend which the Company might pay on their ordinary stock, and on their 3½ p.ct. maximum stock, respectively, in regard to the current half year and of each subsequent half year until the expiration of a period of two years from the termination of the war, should not depend upon the price charged by the Company for gas supplied by them in that half year, but might amount (*a*) in the case of the ordinary stock, to the rate of 2 p.ct. per annum authorized by the existing Order, and (*b*) in the case of the 3½ p.ct. maximum stock to three-quarters of the pre-war or the maximum rate of dividend of such stock, and to authorize the Company to charge from time to time such prices for gas as to produce net divisible profits sufficient for the payment of such dividends.

Representations in respect of the application had to be made to the Board of Trade within fourteen days of the notice. After careful consideration, the Committee decided to direct the attention of the Board to their representations made in the 1918 Order, and in particular the desirability of the imposition of the following safeguards in the event of the Board deciding that the shareholders of the Company were entitled to further relief :

(*a*) That any Order made should expressly provide that the relief should cease as soon as it was shown from any annual audited accounts that the price charged exceeded the price calculated under the statutory scale to give the dividends of 3 p.ct. and £2 12s. 6d. p.ct., respectively.

(*b*) That the Company shall be precluded from increasing their reserve fund or the amount of profit carried forward.

(*c*) That the Company shall only be entitled to charge against revenue the manufacturing costs and maintenance and administrative expenses necessary for the upkeep of the undertaking, and shall not include therein any capital outlay or expenditure for improving the undertaking.

(*d*) That it shall be the duty of the Company's auditors to certify compliance with these conditions.

The Committee expressed the opinion that if the Board of Trade were satisfied that the increased rise of 6s. per ton in the price of coal justified an increased charge to the consumer of 6d. per 1000 c.ft. of gas, the application could not reasonably be opposed, subject to the safeguards proposed by the Committee and the insertion of a proviso that in the event of a decrease in the amount paid for coal during the period for which the Order is operative, the price of gas should be correspondingly reduced. The Committee desired the Court's approval to the action taken.

Mr. WALTER SPYER asked whether the conditions which the Streets Committee thought should be incorporated in the Order had been accepted by the Board of Trade?

The TOWN CLERK (Sir James Bell) replied in the negative.

Mr. LEO TAYLOR objected that the matter had only been considered by the Streets Committee. It should also have been before the County Purposes Committee, whose duty it was to supervise the testing of gas and to ascertain whether the quality of gas was up to the proper standard. The value of gas to the consumer depended upon the quality of the gas—the work the gas would do—quite as much as the quantity of gas which came through his meter. The vast importance of the matter had been recognized by the Board of Trade, who some time ago appointed a Fuel Research Committee who had been inquiring into the question of the calorific power of gas and the method of charging a consumer for the value of the gas delivered to him, instead of simply for the quantity of gas. Something had been published in the trade journals about the varying value of the gas delivered in different parts of the City. The Examiners tested the gas at various testing-stations, and although the gas was supplied to the consumer at a certain fixed price, the consumer on the other side of the street might be receiving gas of a different calorific value, perhaps to the extent of 30 or 40 p.ct. or more. This was not right. It was one of the matters that ought to have been urged on behalf of the Corporation when the Company asked for an increase of price. The question of the cost of coal and all these other matters was, of course, very important; but, as representing consumers in the City, both for lighting and for power, it was the duty of the Court to safeguard them when it came to a question of the Company asking that the price of gas should be increased. If it was not too late, he should still like the County Purposes Committee to consider the matter.

The TOWN CLERK: It is decidedly too late.

Mr. TAYLOR said he would content himself with making a strong protest, because he felt that it was of great importance, when the matter came up at any time, that it should be referred to those who had the control of the vital character of the gas itself. The calorific value was the basis upon which the supply of gas should be valued; and it should be set down at British thermal unit value. That was what they wanted from both the Companies.

The TOWN CLERK explained that the representations made to the Board of Trade were not adopted; and, the Order having already been issued, the matter was now closed.

BRENTFORD GAS COMPANY'S STANDARD PRICE.

Demand for a Public Inquiry.

The General Purposes Committee of the Heston and Isleworth Urban District Council report that they have had before them a notice from the Brentford Gas Company of an application made by them to the Board of Trade for an Order under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, modifying the statutory provisions regulating the charges to be made by the Company for gas supplied by them.

The standard rate of dividend on the "A" consolidated stock of the Company is 4 p.ct. per annum, and on the "B" consolidated stock 3½ p.ct. per annum. The standard price is 3s. 9d. per 1000 c.ft. In respect of any half year during which the price charged by the Company exceeds the standard price, the standard rate of dividend has to be reduced by 1s. p.ct. in respect of the "A" consolidated stock, and by 1s. 3d. p.ct. in respect of the "B" consolidated stock for each 1d. by which the standard price is increased; and, conversely, the standard dividend may be increased by 1s. p.ct. on the "A" consolidated stock and by 1s. 3d. p.ct. on the "B" consolidated stock for each 1d. by which the standard price is reduced. The Company now apply for a modification of these provisions in respect of the half year ending Dec. 31, 1919, and for a period of two years after the war, to enable them to charge for gas at the rate of 4s. 10d. per 1000 c.ft., without being liable to reduce the dividend on the "A" and "B" stocks below 3 p.ct. and 2⅞ p.ct. per annum respectively.

The Committee report that an objection to the application has been made to the Board of Trade on behalf of the Council, urging that the Company are unable to justify the heavy increase in charges which they now propose to make; that the application discloses a desire of the Company to place upon the consumer an undue proportion of the increased burdens which this undertaking, in common with all others, is called upon to bear; and that the modification, if sanctioned, would place in the hands of the Company undue latitude in the matter of charges for gas and dividends. It has been suggested to the Board that a public inquiry should be made into the financial position of the Company, and that local authorities within the area of the Company's supply should be given an opportunity of being represented thereat.

PLYMOUTH AND ITS GAS SUPPLY.

Consequent on the railway strike, and the resulting practical cessation of the postal service, news from our West of England correspondent has this week failed to reach London. We have therefore to rely on a report in the "Western Morning News" of the serious state of affairs as to the gas supply of Plymouth and Devonport.

Last Thursday the "Western Morning News" reported: Plymouth is threatened with a total failure of the gas supply next week, or, at the latest, the week after, if coal rations are not introduced forthwith. In consequence of having but a small stock of coal, and being unable to get more unless the present impasse is surmounted, the Plymouth and Stonehouse Gas Company on Tuesday issued notices to the men in their employ which expire next Tuesday. The following announcement was posted at the works: "As the stock of coal will only last until Monday next, and further supplies are stopped, I regret to give notice that the services of men at these works will not be required after Tuesday next. Every effort is being made to overcome the difficulty; and a special meeting of the Directors has been convened with a view of preventing the inconvenience and hardship resulting from this notice.—J. H. Ellis, Chairman and Managing Director."

A situation which is obviously one of the gravest concern, has arisen with practically no warning; and householders may well stand aghast at the prospect. The biting irony of the matter is that while the Gas Company have but little coal, the steamship *Devereux* lies alongside the wharf with 1800 tons on board—the idle and deserted appearance of the neighbouring quayside making her seem like a derelict that had somehow drifted into port. The primary cause of the trouble can be traced to the action of a few men engaged in discharging the cargo last week, who ceased work because a demand for payment on a tonnage basis was not conceded by the Sutton Harbour Company, by whom they were employed. The effect of cutting-off the gas supply of the main portion of the town would, of course, be fraught with the most serious consequences. The Plymouth Gas Company have 40,000 consumers, who probably represent a population of about 200,000; while there are also about 24,000 gas-cookers in use. Besides the loss of supply in this connection, the stoppage would be actutely felt in many manufacturing concerns where gas is employed as motive power. Some 5 p.ct. of the total manufacture goes in engine consumption; and this figure does not represent the whole of the gas used in this way.

Mr. J. H. Ellis, the Chairman and Managing Director of the Company, on Tuesday went to London to see if further supplies of coal could be secured; and yesterday he addressed a meeting of the men at the works, and in a clear and candid speech, to which was given the most earnest attention, he made a full exposition of the state of affairs. Mr. Ellis said he had asked them to meet him in order that he might explain to them the position in which they were placed. When he returned the previous night from London, where he had been to do what he could to meet the difficulty, he was sorry to hear it had gone round the works that the notice was a piece of bluff. He was sorry

people should think him so foolish as to play a game of bluff with 500 men in the Company's employ and 40,000 consumers. Bluff, he understood, was a pretence to impose on an adversary. In the first instance, he had hoped that his long residence in Plymouth would have told the workmen, at any rate, that he was not a man who pretended, and in the second place he had hoped that such work as he had been able to do while Chairman of the Company would have led them all to think that he had not looked upon them as adversaries, but had tried to look upon them as friends. He would tell them the exact position in which they and the town stood. They had enough stock of coal—and they could judge for themselves whether this was pretence or not—to supply gas to the town in the normal way until Monday, or perhaps Tuesday. Lying out a few yards from them was the ship *Devereux*, with 1800 odd tons of coal on board. This ship was not unloaded, and so far as his information went—and he had been at much pains to get the exact position from the Sutton Harbour Company—would not be unloaded because of an unfortunate dispute which affected some sixteen to twenty men. He was deeply sorry for this. They told him that the terms asked for would practically double the wages of the men engaged in the work; and that it was impossible for them to pay it. He wished to make quite clear the position of the Sutton Harbour Company and the Plymouth Gas Company. The former Company built the wharf for the Gas Company—the latter agreeing to pay 6d. per ton dues, instead of the 4½d. per ton they used to pay. By an arrangement made some time ago by his predecessor, the late Sir Joseph Bellamy, the Sutton Harbour Company did the work of unloading. He found this arrangement in force when he came to them a little more than a year ago; and he was dissatisfied with it. He thought the Sutton Harbour Company was making too much money out of the Gas Company. He told them so, and in the result got reduced terms from them for one year. This was the position now. He had asked them to allow him to undertake the work in future; and he thought he might say they would agree to do so. In everything affecting the Gas Company, he preferred to deal with their own men direct. If differences arose between them, he was always prepared to meet them, thrash the differences out, and agree with them or agree to differ. That was why he wanted the whole thing in his hands. They could not make gas for the normal supplies beyond Monday or Tuesday without the coal in the ship. With short supplies of gas from 7 until 9 a.m. and 6 until 9 or 10 p.m. they could carry on until Monday week. That was all they could do. He went to London on Tuesday to see if he could get coal. He went first to their shippers, Messrs. Cory and Co.; and they said it was an impossible position for them; they must get the *Devereux* unloaded; and—this was the vital part—they must have some assurance that difficulties of this kind would not recur, or they could not send more ships. Unless they got the *Devereux* unloaded—if they were unable to help him with their mates to get her unloaded—and unless he could get arrangements with Messrs. Cory or other shippers for more coal to come, they were only postponing the evil day for a fortnight. He also went to the Coal Controller and told him it was the most serious position imaginable; and that Plymouth would be without light or heat next week unless he could help them. People said a great deal to the prejudice of Government departments—and far be it from him to say that a great deal of it was not deserved—but so far as the man he saw was concerned, his impression was that he intended to help them, that he was fully alive to the position, and that he would help them if he could. The seaborne coal was stopped by local action. He was not blaming anyone; but that was the position. If they got railway trucks along (and he thought they could) an assurance would be wanted that they could get them unloaded. They could not make gas, except water-gas, without coal; and therefore they were absolutely powerless to keep the 40,000 consumers in Plymouth, representing some 200,000 people, supplied unless they had the coal, and unless they were reasonably assured in regard to future supplies. This was a plain statement of facts which anyone could understand; and that was why the notices were sent out. He thought it necessary to tell them the position in which they would inevitably be placed. He told them, and he meant it, that his colleagues and himself would do their very utmost to alleviate any difficulties due to the stoppage from causes over which neither they nor he had any control. They had had a meeting that morning, and would do the utmost they could. They had given him a free hand to take those present and the public into their confidence; and he had invited the Press there so that every man and woman in the town might know the position. Their deliberate purpose in putting the town on short commons and using as much water gas as they could was to alleviate the hardship on the town. They must not be under any misapprehension. They (the men) were most important; but the most important thing of all was the 200,000 consumers. The notices would and must be acted upon unless they were able to get the coal in and deal with the difficulties he had placed before them. He asked them for nothing but to extend to the town the goodwill they had always shown him; to do their best with their mates to get the ship unloaded; to do their best with them to make arrangements with him in the future, if they would, for the regular unloading of these cargoes. As man to man, he asked them to do their best to help the town, to help themselves, and, lastly (the smallest part of all, but he was not at all ashamed to make the claim), the shareholders of the Company. Capitalists they called them. Capitalists, if they liked, in an invidious way. But the average holding in the Company was not more than £350. It was not held by rich men. Recently they had to put up the price of gas. People said: "What's the odds what you pay for coal or material or labour, you can pass it on." They passed on the sixpence. They were bound to, to keep the concern solvent. What did this mean? It meant cutting-down 15s. on every £100 of the Company's capital, and they were receiving to-day only 3¾ p.ct. on their ordinary stock. If any man said that this was a fair return for money invested, he would be surprised at his hardihood. Upon this matter the Gas Light and Coke Company's (London) men—not at the instigation of the Directors, but on their own deliberate initiative—had a mass meeting about three weeks ago, and asked the Government to do justice to the shareholders to enable them to earn at least the dividends that were paid before the war. He left the matter in their hands, in the hope that they would suggest to their mates and friends some way whereby the public of Plymouth might not be deprived of one of the prime necessities of existence during the forthcoming winter, which had troubles enough ahead, and from which he wanted to save Plymouth if he possibly could.

By a notice in our local contemporary's advertisement columns it was seen that on and after Friday last the Plymouth Company limited the supply of gas to the hours of 7 to 9 a.m. and 6 to 10 p.m. Supplies of coke were stopped forthwith.

POSITION AT DEVONPORT.

A similar state of affairs was precipitated at Devonport at mid-day last Wednesday, when about eight men, members of the Dockers' Union, who were unloading coal from the *Hani* at Tamar Wharf for the Devonport Gas-Works, stopped work after launching a similar demand as the men engaged on the *Devereux*—for payment on a tonnage basis. The *Hani* had a cargo of 400 tons of coal from Newcastle; and about two-thirds of this had been discharged when the demand was made. At this gas-works it is said there is enough coal for two or three weeks' supply of gas.

Later from Plymouth.

Friday's local paper contained, in an advertisement, the following notification:

An intimation having reached the Plymouth and Stonehouse Gas Light and Coke Company to the effect that the men on strike are being advised to return to work, in view of the acceptance by the Plymouth Employers' Association of the Minister of Labour's proposal for the submission of the question in dispute to a conciliation meeting, the notice published in to-day's press, limiting the hours of supply is hereby cancelled, and the supply of gas within the Company's area will be continued as usual until further order.

By order of the Directors,
GEO. H. BOLTON, Secretary.

ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

Half-Yearly Meeting.

The Half-Yearly Meeting of the Alliance and Dublin Consumers' Gas Company was held in the offices, D'Olier Street, Dublin, on Thursday last—Mr. JOHN MURPHY (the Chairman) presiding.

The SECRETARY (Mr. W. J. Grey) read the notice convening the meeting, and also the report for the half year ended June 30 last (noticed in the "JOURNAL" for Sept. 16, p. 629).

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the report and statement of accounts, said that while perhaps the figures were not quite so favourable as those submitted on the last two occasions, yet, when the abnormal times through which they were still passing were taken into consideration, they would not, he hoped, be regarded as unsatisfactory. The special features disclosed the fact that the total quantity of gas sold was less, and the cost of production, in respect of both materials and labour, had still further advanced. Moreover, they could not claim on this occasion that the income from residuals had improved. The discontinuance of munition work had resulted in a substantial reduction in the sales of gas to ordinary consumers, and the further curtailment of public lighting obviously affected their output under this head. On the other hand, the consumption of gas by prepayment consumers continued to improve; and sales were up by 10 million c.ft. compared with the corresponding period. The capital expenditure, although it had amounted only to £3301, was greater than that for several previous periods, on account of the necessity of purchasing a large number of new meters. At the same time, the credits exceeded the expenditure; and they had again reduced their expenditure on capital account by £1375. The revenue account showed that the profit was less by almost £15,000. As a matter of fact, the increase in the war bonus to employees would more than account for this; but there were, of course, other increases and decreases which had to be taken into consideration. All the items relating to manufacture remained about the same, with the exception of repair and maintenance of works, which was double that of the corresponding period. It had been found necessary to increase the capacity of their coal gas plant; and it was decided in March last to place an order with West's Gas Improvement Company for a vertical retort installation at the City works. The construction had been commenced; and the appropriate proportion of the contract sum had been charged against the accounts for the half year under review. The balance of the excess expenditure was occasioned by the increased cost of materials and, to some extent, wages. Repairs of mains and services showed a decrease of £5700, owing to the fact that in the half year they were not called upon to renew any of the larger mains. The cost of repairs to meters was larger by no less than £4148. The extraction of special ingredients from the gas, as required by the Ministry of Munitions for war purposes, appeared to have had a detrimental effect on the Company's meters; and this, coupled with the fact that a large proportion had been many years in service without renewal, now involved additional expenditure. It had also proved a difficult task to obtain meters in adequate quantities for renewal purposes, and a number of the consumers had been greatly inconvenienced by the delay. Taking the total expenditure on distribution—after deducting the profit on sales of gas-fittings—it was satisfactory to find that it compared favourably with the corresponding period, showing a reduction of over £3300. The results in connection with the maintenance of the public lamps also showed considerable improvement on the corresponding period. Rates and taxes were higher, in spite of reduced assessments, owing to the increased ratings. Management was also up by about 10 p.ct.; but this was merely due to accretions in the ordinary course. With regard to income, it was gratifying to find that the net receipts for gas were higher by almost £13,000, although there had been no variation in price. The rental figures remained about the same, except the charges for prepayment meters and stoves, which again

showed a satisfactory improvement. The reduction in the income from residual products—seeing that prices had improved—required some explanation. It lay in the fact that last year, in the same period, they carbonized over 8000 additional tons of coal. The consequent effect on coke was twofold. In the first place, the make was correspondingly less, and, as more carburetted water gas had to be made, a larger quantity of coke was used on their own plant. While present conditions remained, however, it was imperative that every economy should be effected in the use of coal, and no effort had been, or would be, spared to attain this end. The only item showing an increase, and that of comparatively small amount, was the sum received for ammoniacal liquor and sulphate. In the net revenue account, it would be seen that the bank interest had been reduced by one-half, which was a welcome improvement. But after providing for this and debenture interest, and allowing for the credit on income-tax account, the larger dividend of £3 6s. 3d. could be met without encroaching on the carry-forward from the previous half year to the extent of £1068. The Board of Trade had now granted an Order under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918; but, unfortunately, it only authorized the increased dividend for the half year now under review. An explanation had been sought as to the reason for depriving stockholders of the arrears of dividend to which they appeared to be entitled; but the reply received was not of a satisfactory nature, particularly when it was borne in mind that the Company's application was made as far back as Aug. 10, 1918, and the Order was not issued until April 1 of this year. Parliament had not kept faith with gas stockholders. With the Company's maximum dividend at £3 6s. 3d. p.ct. per annum, how could it be expected that capital could be raised except at a substantial discount? But Parliament might attempt to remedy existing financial hardships by general legislation in the near future. Unless this were done, the Directors would be obliged to consider the advisability of promoting a Special Bill on behalf of the Company. The amount of unaccounted-for gas showed an improvement of 1½ p.ct., and this, perhaps better than anything else, justified their extra expenditure during the last few half years on meters and mains. With regard to the general balance-sheet, their several funds showed a further increase of £3600. The value of their stocks was higher by £11,000; and their debtors were up to the extent of £8500. Owing to the recent advance of 6s. per ton in the price of coal, and the increased cost of other materials and labour, they found it imperative to raise the price of gas through the limits of supply by 6d. per 1000 c.ft., as from the date of the meter readings for the September to December quarter, 1919. As regarded the works, the buildings and plant had been maintained in a good state of repair. The complete removal of a stack of ninety retorts at the City works was in progress, and would be ready for operation during the coming winter. The vertical retort plant comprised two units of retorts, set on the Glover-West principle. The site chosen for this installation was the old No. 1 Retort-House, and the existing building was being utilized as far as circumstances would permit. The plant would have a normal capacity of 2,000,000 c.ft. of gas per day.

Mr. F. J. DICKENS, in seconding the motion, expressed the opinion that the Government had treated the gas industry "scurvily;" but he hoped that better times were in store for all of them.

The motion was then put, and unanimously agreed to.

THE DIVIDEND.

The CHAIRMAN moved a dividend of £3 6s. 3d. p.ct., in lieu of the maximum statutory dividend of £2 17s. 6d. p.ct. He repeated that this procedure was adopted under the Board of Trade Order.

Mr. J. E. FOTTRELL seconded; and the motion was agreed to.

SUGGESTED GAS INDUSTRY CONFERENCE.

Captain PURCELL, in moving thanks to the Directors and staff, emphasized the views already expressed in regard to the treatment of shareholders in the gas industry by the Government, and especially by the Board of Trade, and also by Parliament. He paid cordial tribute to the present management of the Company, and to the efficiency with which the work in all departments was carried out. He suggested that if the Government did not take the necessary steps to afford the relief which they sought, the Directors should see whether it would be possible or practicable to have a conference with representatives of other companies with the object of securing combined action.

Mr. G. W. NORMAN seconded the motion, which was passed.

The CHAIRMAN, in acknowledging the compliment, said he was sure they all agreed that the Directors were acting wisely in contemplating action on their own account if the Government failed to deal with the position by general legislation.

The meeting then terminated.

Finances at Colwyn Bay.—Presenting the estimates for the coming year to the Colwyn Bay Urban District Council, Mr. J. Smith (the Gas Manager) said the undertaking last year showed a profit of £400, which was regarded as very satisfactory, in view of the extraordinary increases in working costs and the low selling price. For the coming year, provision had to be made for an increase of 6s. a ton in the cost of coal and of £1711 in labour, making a total of 10½d. per 1000 c.ft. of gas sold. The Chairman said the people ought to be thankful that the undertaking had not only paid its way all these years, but that the Committee would be able to manage with only an increase of 5d. per 1000 c.ft. in the price.

Chesterfield and its Gas-Works Coal Supply.—Under the heading "Comic Control: Durham Coal Forced on a Town in Derbyshire," the "Evening News" last week said: The man who took coals to Newcastle is left far behind for whimsicality by a Government Department. The Chesterfield Gas and Water Board contracted for Derbyshire coal. It is at their back-door, so to speak. But the Controller's office directed that Chesterfield's coal should be sent elsewhere, and supplied instead 600 tons of Durham coal which cost the Board 8s. a ton more than the local fuel they had ordered! The Durham coal was inferior, as well; and, in addition to the loss incurred in the manufacture of gas, there was a lamentable waste in the transport. The Chesterfield authority is forwarding a strong protest to the Coal Controller.

BRITISH GAS LIGHT COMPANY, LIMITED.

The Half-Yearly Ordinary Meeting of the Company was held last Wednesday, at the London Offices, No. 11, George Yard, Lombard Street, E.C.—Mr. R. S. GARDINER in the chair.

The SECRETARY (Mr. A. W. Brookes) read the notice convening the meeting, the Auditors' report, as well as the reports referring to the Norwich station. The report of the Directors for the half year ending June 30 was as follows:

After providing for interest on debentures and debenture stock, the net revenue amounted to £15,470, which, with the undivided balance brought forward from the preceding half year, leaves an available balance of £66,845.

The Directors recommend the payment of a dividend at the rate of 10 p.ct. per annum, less income-tax, payable on Oct. 3. This will require the sum of £19,950; leaving a balance of £46,895 to be carried forward.

At Hull, the profit earned falls short of the interest authorized by Parliament by £11,442, notwithstanding the increase in the price of gas from April 1 to 4s. per 1000 c.ft. The sale of gas shows a decrease of 4½ p.ct.

At Norwich, the price of gas was increased to 4s. per 1000 c.ft. as from April 1. The sale of gas increased by 3·2 p.ct.; but the profit fell short of the parliamentary interest by £2855.

At the Potteries, the price of gas was increased to 3s. 6d. at Jan. 1; and this station has earned its parliamentary interest for the half year. The sale of gas shows an increase of 12·8 p.ct.

At Trowbridge, the price of gas was increased to 4s. 6d. per 1000 c.ft. from April 1; but the profit realized was £995 less than the authorized interest. The sale of gas increased by ½ p.ct.

At Holywell, the price of gas was raised to 5s. 6d. from April 1, and the sale of gas shows an increase of 7½ p.ct.

Owing to further advances in workmen's wages, reduced working hours, increased cost and inferior quality of the coal allocated to the Company, and to the extra cost of conveyance of coal by sea, the earnings of the past half year are disappointing, and at most of the Company's stations very inadequate. It will be necessary, to the extreme regret of the Directors, to further advance the price of gas at those stations at which the maximum price authorized by Parliament has not already been reached.

The Directors who retire are Mr. R. S. Gardiner and Mr. Henry Woodall; the Auditors are Mr. E. Knowles Corrie and Mr. William Cash, F.C.A., and they respectively offer themselves for re-election.

The report and accounts were taken as read.

AN INCREASED SALE—SOME FINANCIAL AND OTHER PARTICULARS.

The CHAIRMAN, in moving the adoption of the report and accounts, said the total quantity of gas sold during the half year was 1326 million cubic feet, as compared with 1318 millions in the correspoding period of last year; being an increase of ½ p.ct. Having regard to the restrictions due to the Household Fuel and Lighting Order, and to the general tendency to economy which the Company had encouraged in consequence of the scarcity of coal to keep the consumption of gas within bounds, he thought the result quite satisfactory. Coal during the half year cost £136,640, as compared with £114.757 in the corresponding half year. As a matter of fact, 3514 tons less coal was carbonized; but the cost of coal was £21,882 more. The cost of wages was interesting. The wages for the half year came to £91,854, as compared with £58,140 in the corresponding half—being an increase of £33,714. He thought, too, that it would interest the proprietors to compare the wages for the half year against those for the corresponding period of 1914. For the half year to June 30 last the cost of wages was £91,854; for the June half of 1914, it was £44,017—an increase of £47,837. The addition to capital account in the half year amounted to £11.398, which was almost entirely due to the purchase of land at Norwich. The proprietors would quite understand in present circumstances that, with the high cost of all materials and labour, the Directors were watching capital outlay with the utmost care. The capital account per million cubic feet sold now stood at £559. The percentage of unaccounted-for gas for the twelve months to June 30 was 3·95, which was exceedingly creditable to all their engineers. This compared with the previous average of 5·17 p.ct. The net profit for the half year was £15,470, which compared with a profit of £5661 in the previous half.

FALL IN MARKET VALUE AND THE POSITION AT HULL.

The Directors had been surprised to notice that the issue of the report and accounts was followed by a rather sensible drop in the market value of the shares, for which he failed to see any justification. The proprietors were aware that for the last twelve months the Company had suffered very much at Hull (which was the Company's principal station) owing chiefly to the unsuitable character of the coal supplied to that station, which resulted in very severe damage to the special form of carbonizing plant which at Hull had been naturally selected for the carbonization of Yorkshire coal. The result of the harm done to the settings, and the poor results obtained from the classes of coal supplied, was that the profits at Hull for the previous half year were almost *nil*. The half year now under consideration showed a very considerable improvement. The profit there had been £9114, which, however, still fell short by about £11,000 of the interest which Parliament had fixed as the return on the capital at this station. The improvement that was taking place would, he was confident, be more than maintained during the present half year; and any anxiety that might have been occasioned by the poor results of the second half of last year should, he thought, be dispelled by the considerable recovery that had already taken place at Hull. There was this further to be said in regard to the income at Hull for the past half year. The last increase in price—viz., from 3s. 2d. to 4s. per 1000 c.ft.—only came into force on April 1. Therefore, the half year under consideration only had the benefit of the increase in price for three months. The Directors had now decided—having regard to the increase of 6s. that had been imposed upon coal, the reduced working hours, and to the fact that the returns were not giving the Company the parliamentary rate of interest—to further increase the price of gas to 4s. 6d. from Oct. 1. They had also reluctantly resolved to increase the rent of meters and stoves and fittings. They had gone into the figures very carefully; and with the present cost of labour for the repair of meters and other appliances, with the present cost of all

materials needed for their maintenance, and the largely increased cost of new meters and stoves, they had had no option but to introduce a considerable increase in the rentals.

RETIREMENT OF MR. YOUNG AND ELEVATION OF MR. COPP.

The results at Hull were continually before them for some months, and the Board came to the conclusion—Mr. Young having expressed a wish to retire—that it was not fair to one who had been in their service for so many years, that at his age and after the stress and strain of all he had had to undergo during three or four years, the responsibility and stress should still be thrown upon him. He (the Chairman) was sure it was in accord with the wishes of the proprietors that the Court of Directors granted him a generous retiring allowance, after his long period of service with the Company. They had appointed as successor to Mr. Young, Mr. Copp, who so successfully managed their Potteries station, which, it would be seen from the accounts, was the only one that during the past half year had earned its full parliamentary interest. They could not possibly spare Mr. Glover their senior Engineer from Norwich, where he was engaged in most important works' extensions, which he himself had designed. So they took Mr. Copp, the next in seniority, to Hull. He had now been in charge of the station since July 1; and he (the Chairman) was happy to say the wisdom of their selection was already borne out by the returns submitted to them.

AFFAIRS AT NORWICH—EXTENSIONS AND CAPITAL.

At Norwich, the price of gas was increased from 3s. 8d. to 4s., also from April 1. Consequently the half year under review had not had the full advantage of the increase. The Directors had decided to further increase the price to 4s. 6d. from Oct. 1, as well as the rents of meters and stoves, for the reasons he had already given in respect of Hull. Now he came to an important matter in connection with Norwich. He had told the proprietors that the Directors were exercising the greatest possible care and supervision over capital expenditure. But at Norwich they were faced with an absolutely necessary and inevitable outlay of a considerable sum. This would not come upon the proprietors as a surprise, as they knew of it from the Bill the Company had had before Parliament authorizing them to raise a further sum of capital. When the Bill was introduced, they asked for a total new issue of £400,000. At the very urgent request of the Corporation of Norwich (with whom the Company had always been on very friendly terms), and not wishing to go to Parliament in conflict with them, the Directors reluctantly agreed to reduce the sum to £200,000. They did not think it was sufficient; and they told the Corporation so. Their Engineer, after going as carefully as he could, in the circumstances of the time, into the probable cost of the immediate extensions, came to the conclusion the amount named would about suffice to carry them through at Norwich at all events for a few years. Under the agreement they came to with the Corporation it was further stipulated that only £120,000 of the £200,000 should be expended at the Palace works. Now that they had invited tenders, and had got in prices, and had gone thoroughly into such important questions as the foundations (which had given considerable concern), they found that, at the Palace works alone, the inevitable expenditure to enable them to put up plant to meet the immediate requirements would amount to not less than £150,000. The Directors were therefore now approaching the Norwich Corporation reminding them of what took place, and pointing out that during the last eighteen months the advances that had occurred in the cost of materials could not have been anticipated at the time the original estimates were made. He had every reason to hope that the Corporation, who had always treated the Company with courtesy, and whom they had always tried to serve efficiently and loyally, would meet them, and at all events agree that the whole of the £200,000 should be expended at the Palace works, The increase in the consumption of gas at Norwich for the half year under review, as compared with the corresponding half of the year before the war, was 41 p.ct. It could quite be imagined that to meet an increase of this amount, and the further increase that would certainly occur when the present restrictions on the consumption of gas were removed, must necessitate the construction of—in fact, would compel them in their duty to the inhabitants of Norwich to put up—sufficient plant to meet their requirements.

THE NEXT ISSUE OF CAPITAL.

The accounts would show that they owed the bank £45,000 on account of capital outlays that had been incurred from time to time; and the Directors were therefore engaged in considering the very difficult question as to when would be the proper time to make a new issue, and whether it should take the form of ordinary or preference shares or debentures. The matter was receiving most careful attention. They were having very competent advice; and he might assure the shareholders that, in accordance with their usual practice, they would give them, as far as the Act permitted, the first offer of whatever capital they decided to raise. As they knew, in past years it had always been the practice of the Company, whenever capital was raised, to issue it to the shareholders at a slight reduction upon the market value. To this practice the Directors would adhere on this occasion.

THE NEW ENGINEER AT THE POTTERIES.

Then he came to the Potteries station. The transfer of Mr. Copp to Hull had necessitated a new appointment as Chief Engineer at the Potteries. The Court received a number of applications. He did not remember any occasion on which it had been so difficult to sift from the large number of eligible applicants the five or six whom the Court interviewed. Then it was very difficult between these six gentlemen to decide which of them was most likely to successfully succeed such an able Manager as Mr. Copp. They finally decided upon Mr. Armitage, who was the Chief Engineer at Lancaster. He came to them with most excellent credentials, both in the shape of the results of his own workings at Lancaster; and also in the shape of a testimonial in quite exceptional form from the Mayor and Corporation of Lancaster. He (the Chairman) thought they were very fortunate in securing such a gentleman for the management of the Potteries station, which was a very difficult district. It was spread over a considerable area; and with subsidences from coal workings, it was troublesome to manage. He believed they had found in Mr. Armitage an Engineer who would do very good service for the Company.

MODERNIZATION AT TROWBRIDGE.

At Trowbridge they must modernize their carbonizing plant. They had decided to instal a small water-gas plant, because nowadays, with the difficulty of getting gas coal—suitable gas coal—at their works, they had found, where they had water-gas plant, that it was of the greatest possible assistance. They would also modernize the ordinary retort-settings.

RETIREMENT FROM THE CHAIR.

There was a paragraph in the report which stated that the Directors who retired were Mr. Woodall and himself. He thought before the resolution was put it was desirable he should mention that this was the last occasion on which he should have the privilege and the responsibility of addressing the proprietors from that chair. About a year ago his health, he regretted to say, gave way. He had an attack of heart failure; and he was strongly urged to give up most of his work. He was very reluctant to do so; and he struggled on. But the time had now come when he had had to press the Board to accept his resignation. His colleagues had unanimously urged him to continue as a Director, while agreeing to relieve him of the greater responsibility and labour of the chairmanship; and so, if it was the pleasure of the proprietors to re-elect him as a Director, he would, in accordance with the wishes of his colleagues, continue to serve. He thought it was only fair the shareholders should know, before the re-election took place, that he should not be able to continue to fulfil the duties of Chairman. On the 1st of next month he would have been forty years in the service of the gas industry. It was a long period; and even if he were not compelled to do so, he thought he might now have a little more leisure than he had hitherto had.

PROSPECTS.

He was glad as this was his last appearance in the chair to be able to assure the shareholders that the position of the Company, taking the works individually and collectively, was he thought extremely sound. The Company, as they knew, were not subject to the sliding-scale. They had certain maximum prices, and were authorized in various Acts of Parliament to share what was a very moderate rate of interest on their capital. So much of it was raised at a very low rate indeed —3 and 3½ p.ct.—that the parliamentary rate of interest gave them a fair return on the share capital. Through exceptional causes, which he had explained, the results at Hull were for a time disappointing; and as this was the chief station, it pulled down the revenue very considerably. He thought they were getting over this individual trouble; and if the gas industry as a whole continued to progress, as he hoped it would, there was no reason why this Company in particular should not continue to enjoy a fair amount of prosperity.

INDIVIDUAL V. COLLECTIVE ACTION.

It would rest upon the gas industry as a whole to make strenuous exertions to recover its liberty of action. He did not believe that concentrated action, or (what sounded very attractive) a united representative body, was the best method of obtaining concessions from the Government. He was not referring to the present Government in particular, but to any Government. He thought if the industry was entitled to, and was compelled by circumstances, as indeed they were, to require relief from the Government, individual importunity was the best and most forcible method of action. He would that every gas manager in the country would endeavour to induce every Mayor and Corporation, and every local Chamber of Commerce and Member of Parliament, to approach the President of the Board of Trade separately, to represent the enormous inconvenience to the community of the very heavy increase in the cost of gas. At Hull before the war, the Company were charging 1s. 10d. per 1000 c.ft.; now the inhabitants had to pay 4s. 6d. He thought this gave the local authority not only very good ground, but he considered it almost imposed on them the obligation to inquire into the causes of such a heavy burden on the community; and if it could be (as it could be at Hull) shown to be due not only to the high cost of coal, which would have to be justified, and to advances in wages, but also to the enforced allocation of coal that was totally unsuited to the gas-making plant at the works, surely by degrees such an amount of influence, with the help also of local members of Parliament, could be obtained as would prove effective. They wanted to point out to the Government, not by one mouthpiece but by hundreds of mouthpieces, that until the gas industry recovered its freedom of action—especially in the matter of the selection of the sort of coal and the means of conveyance—the industry as a whole could not recover its due measure of prosperity.

RELATIONS BETWEEN EMPLOYED AND EMPLOYERS.

There must also be more direct contact between employers and employed. At Norwich their Manager suggested the formation of a Works Council; and asked the opinion of the Directors upon the proposal. The minute of the Directors was: "The Committee approves in principle of the formation of a Works Council through whom more direct contact with their workmen can be maintained; but the proceedings must be established on the basis of mutual concessions and mutual confidence, and of a community of interests." Those were the lines upon which relations between employers and employed should now be strengthened and improved; and if the gas industry could be freed from some at least of the restrictions and leading strings to which it submitted whole-heartedly during the war—perhaps too meekly—then it would regain its prosperity, and in it the Company would undoubtedly take its due share.

Mr. FREDERICK WILKIN seconded the motion.

Mr. KENNETH MACKAY asked whether the Borough of Stoke-on-Trent had approached the Directors with regard to the purchase of the Potteries station.

Mr. CHARLES WEBB inquired whether the quality of the coal that was now being supplied was better than it had been.

The CHAIRMAN, replying to a question put during his speech, said he had not at hand the exact numbers of workmen employed before the war and now. But, roughly speaking, he should say there had been

no considerable increase in the number. To an extent perhaps the fact that they had carbonized 3897 tons less coal was important in this regard, because, although a smaller quantity of coal had been carbonized, the wages had more than doubled. Mr. Mackay had asked about the Potteries station. He (the Chairman) congratulated him upon his early information. They understood that the previous week the Corporation did have a meeting, and decided to inquire of the Company at what price they would be prepared to sell the station. The Directors had not yet received any communication to this effect; and therefore the matter really did not arise at the present time. Then Mr. Webb inquired as to the quality of the coal. He thought that from the tone of his (the Chairman's) remarks, and from the obvious strength of his feeling on the subject, it was manifest that even at present—for instance at Hull—they were not getting suitable coal.

The motion was unanimously carried.

The Dividend.

On the proposition of the Chairman, seconded by Major-General W. T. Corrie, a dividend at the rate of 20s. per share, less income-tax, for the half year was declared.

Re-Elections.

Major-General Corrie said it was with pleasure, mixed with feelings of regret, that he had to move the re-election of the Chairman to be a Director of the Company. The regret was due to the fact that unfortunately—particularly for the Board, who had experienced so largely his excellent advice and guidance as their head—he was, as he had informed the shareholders, retiring from the chair. But it was necessary, seeing that his health was not so good as they could all wish. He (General Corrie) was not going to be eulogistic in his remarks about their Chairman. Those on his side of the table knew the nature of his services to the Company; and he could not speak too strongly in praise of them. There was a bright lining to the cloud, in that Mr. Gardiner had consented to remain on the direction.

Mr. Frederick Wilkin seconded the motion, which was heartily passed.

The Chairman, having made acknowledgment, moved the re-election of Mr. Henry Woodall. He remarked that he need hardly say what an enormous advantage and benefit it was to the Company to have on the Board a gas engineer of the admitted competence of Mr. Henry Woodall, and more especially in these days when several important technical questions were coming up week by week. He was also most kind in his visits to the various works. It would not have been of advantage to the Company if he (Mr. Gardiner) had been able to remain in the chair, because it was essential in the case of this Company that the Chairman should have time and health to enable him to visit the stations. During the last few months, he (the Chairman) had been unable to do this; and Mr. Woodall had most kindly, and very often at short notice, gone to the stations to look into technical questions that had arisen. They all, too, entertained such memories of his father's work on the Court of the Company that, apart from the more valid reasons, there was also the sentimental reason which he personally took very much into account.

Mr. Lewis R. Abbey-Williams seconded the motion, which was cordially adopted.

Mr. Woodall thanked the Chairman for his kind remarks, and the shareholders for having re-elected him. Being re-elected a Director, he observed, was not quite the same pleasure now that he heard Mr. Gardiner was resigning the chair. They had all enormously appreciated his work; and he personally felt Mr. Gardiner's courage and foresight had been extraordinary. They had, more especially of late years, had a great many things to decide which needed really a strong and courageous man who thought only of the welfare of the Company, and such a man they had had in their Chairman.

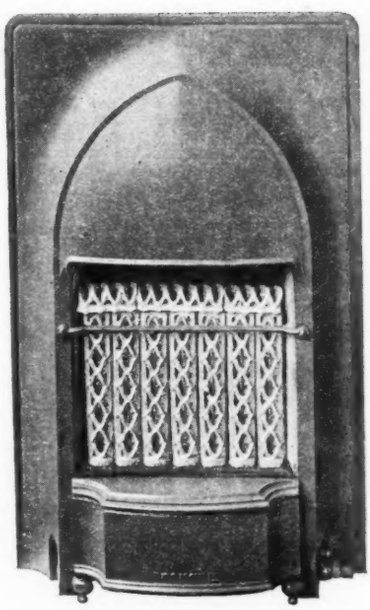
Moved by Mr. Mackay, and seconded by Mr. F. A. Janson, Mr. E. Knowles Corrie was re-appointed an Auditor; also Mr. W. Cash, F.C.A., on the motion of Mr. Webb, seconded by Mr. Mackay.

Votes of Thanks.

Mr. Webb proposed a hearty vote of thanks to the Chairman and Directors. He referred to the strenuous and anxious times the Board had had. The gas industry was not yet out of the wood; but they felt they had a Board well prepared to see the Company through. The shareholders were all extremely sorry to hear of the retirement of Mr. Gardiner from the chair, but were thankful he was continuing on the Board to give them the benefit of his valuable advice.

Mr. Janson seconded the motion, which was unanimously adopted.

The Chairman, in thanking the shareholders for himself and colleagues, could truly say that their best efforts were always directed to managing to the highest advantage the important interests of the Company—the only one in this country, he believed, which undertook the supply of several towns in different districts. This threw on the Board a very great deal of work. He was glad the shareholders appreciated this circumstance, and that the Directors had earned their full approval. He wished to say how much they missed that day a face which had grown so familiar to them at their meetings. He referred to Mr. Bernard F. Harris, their broker. Throughout Mr. Harris's long connection with the Company, whenever they had to ask his advice in regard to new issues of capital or any matter connected with the Stock Exchange, they always found him wise, prudent, and absolutely disinterested. They would miss him very much. His (the Chairman's) next duty was to move a vote of thanks to the Secretary, the Engineers, the staffs in London and at the stations, and the workmen of the Company for their exertions on behalf of the Company during the half year. The shareholders had been good enough to refer to the anxieties of the Court of Directors. But they were immeasurably smaller than the labours and anxieties of the officers on the spot. It was the manager on the spot who saw the poor stuff that was coming to the works, which he was to carbonize; it was the manager on the spot who perhaps had only three or four days' coal supply in stock;



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it was the manager on the spot who had the difficulties to meet of labour and costs, and of getting even small repairs carried out. The relations too of the managers with the consumers could not be made more pleasant by the repeated, though necessary, advances in the price of gas. The services of the Secretary were always readily given. His mastery of the intricate accounts of the Company, and of the intricate parliamentary conditions at each of their towns, was of enormous benefit to the Company. He could not speak too highly of his invaluable services. A great many of the workmen of the Company (whose fathers were probably in the Company's service before them) were quite as loyal to the Company as those engaged in higher positions; and thus it was that he made the resolution as wide as possible.

Mr. WOODALL seconded the motion, remarking that the officers had done extraordinarily well for the Company. He was glad the Chairman had included the men. There had been a great deal of labour unrest; but, in his opinion, there had been less real trouble in the industry than in any other. He believed that in their case the men knew well the Company had their interests at heart, and they had in very many cases responded to this.

The motion was carried unanimously.

The SECRETARY said he had much pleasure, on behalf of all concerned, in acknowledging the vote. He was sure all were striving to their utmost to further the success of the several undertakings; and it would be a source of pleasure to them to receive this acknowledgment of their efforts.

INCREASED GAS-STOVE RENTALS.

Some Illustrative Figures from the Gas Light and Coke Company.

An article on this subject appeared in the "Daily Telegraph" on Saturday. The fact is deplored that "everything is going up." It is because of this that even meter and stove rentals have to follow the same course. The writer refers to the 200,000 (or whatever the exact number is) of consumers on the books of the Gas Light and Coke Company. He is far from the truth. At Dec. 31 last, the total was not 200,000, but 823,118, of which 306,634 were ordinary, and the remainder prepayment. The rental of all the Company's gas-consuming appliances on hire is going up from the beginning of October by 50 p.ct. The article proceeds:

What has puzzled many people, no doubt, is why there should be an increase in the rent of stoves purchased at pre-war cost. An official of the Company yesterday vouchsafed an explanation, and also reasons in favour of raising the rental of stoves instead of the price of gas to meet the extra cost involved in the hiring-out of stoves. As regards the latter point, the Company consider they are not justified in allowing the extra cost of repairs to fall on the price of gas, as this would place part of the burden on the consumers who have purchased and maintain in repair their own cookers, fires, water-heaters, engines, furnaces, &c. There have been sold to consumers: 66,000 cooking-stoves, 130,000 heating-stoves, 79,000 ring-burners, and 10,000 water-heaters—total, 285,000.

During the last fortnight no fewer than 1000 stoves have been sold; and there remains a large and ever-growing demand which cannot be satisfied. The output, which is considerably below that of pre-war times, is further threatened by the moulders' strike. As against the 285,000 appliances sold, the number on hire is 306,000.

Nor do the Company consider that they would be acting justly towards the shareholders in allowing the extra cost of repairs to fall on them. The dividend has already been reduced as a result of the war from under 5 to 3 p.ct., and, asked the official in question, "Where else is there an industry limited, in these days of depreciated money, to a mere three-fifths of its very moderate pre-war dividend?"

The rents of new stoves were increased some time ago, as the cost of stoves to the Company has increased by over 100 p.ct. on account of higher wages and dearer metals; and the Company feel compelled to increase the rents for stoves purchased pre-war because the rents have to cover not merely interest on capital, but the cost of attendance to defects, repair and replacement of parts, and renovation when the stoves are removed from one residence to another, for all of which the Company are responsible. The rents charged hitherto average about 14 p.ct. on the pre-war cost. For instance, for a stove costing £7 they have been asking £1 a year rental. This represented 5 p.ct. interest and about 9 p.ct. for repairs and renewals, which barely covered the cost. An increase of 50 p.ct.—that is from £1 to £1 10s.—would therefore make the return to the Company 21 p.ct. on the original cost. Repairs and renewals have doubled in cost since 1914, and wages are up fully 100 p.ct. Whereas a fitter got on an average 33s. a week, he now receives 69s., and overtime has been proportionately increased. Tin goods, castings, and enamelled linings have increased in cost by 100, 150, and 200 p.ct. respectively. So that the Company, it is argued, would be justified in charging £1 15s. rental at least on the costs they have to bear. They are, however, only raising them to 21 p.ct. on pre-war cost, hoping that repairs may fall from their present extremely high level before very long.

If consumers consider the rental is too high, they have the option of purchase at prices below pre-war cost, and less than half the present market price of similar stoves. In other words, the Company are proposing to sell a stove which cost £7 before the war, and which could not be bought in the market to-day, it is said, for less than £15, at the figure of £6, or to spread payment over four quarterly instalments. Doubtless large numbers of consumers will take advantage of this offer. A number have already intimated their desire to avail themselves of it.

The question of the increase of the rent of meters is under consideration by the directors at the present time; but no definite decision has been come to. At present 17,500 meters are awaiting repair.

The Castlecary Fire-Clay Company, Ltd., has been registered in Edinburgh, with a capital of £100,000 in £1 shares.

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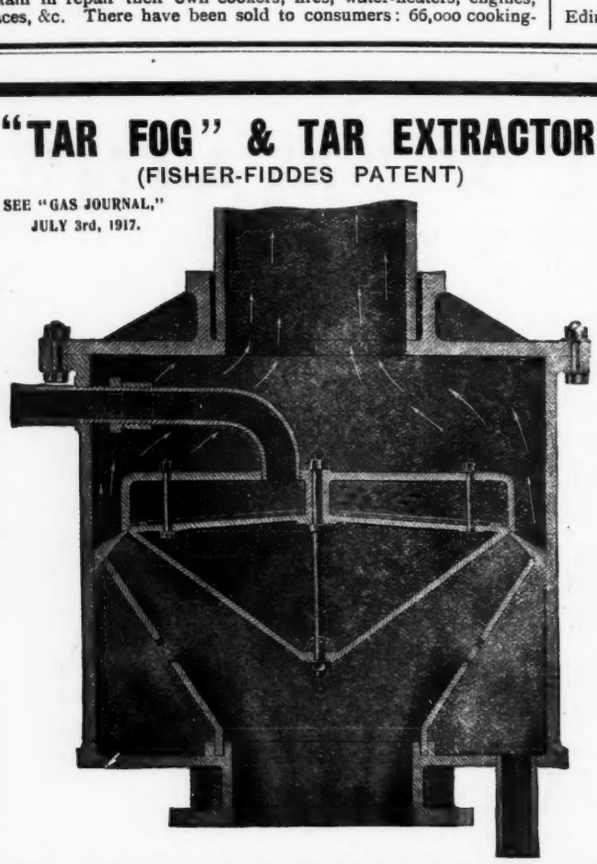
SEE "GAS JOURNAL," JULY 3rd, 1917.



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GAS PRICE INCREASES.

The South Metropolitan Gas Company announce an increase in the price of gas from 4s. 4d. to 4s. 8d. per 1000 c.ft. as from the date of reading meters for the Michaelmas quarter. The 6s. advance of coal will increase the Company's coal bill by some £340,000 a year a proportion only of which will be recovered by the sale of coke at higher prices.

The Gas Committee of the Bradford Corporation have decided, subject to permission being granted by the authorities, to raise the price of gas from 4s. to 4s. 10d. per 1000 c.ft. A resolution was passed by the City Council in July to apply for permission to raise the price from 4s. to 6s., but since that time nothing has been heard of the matter from London.

The Barnet District Gas and Water Company have served notices on their customers of a forthcoming increase both in the price of gas and in the rents of meters and stoves. The rents of appliances are to go up 50 p.ct. from the time of the next meter reading. The extra charge for gas is to be 8d. per 1000 c.ft., making it 5s.

South Suburban Gas Company's Application.

In a notice issued to the consumers, Mr. Wilfrid Wastell, the Secretary of the South Suburban Gas Company, says the Directors much regret that they have been compelled to make application to the Board of Trade, under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, for authority to increase the price of gas from the date of the meter readings for the September quarter to meet the following additional charges: (1) The increase of 6s. per ton on all coal, which took effect as from July 21; and (2) the substitution of sea borne coal from Durham for the rail-borne coal from the Midlands hitherto used almost exclusively by the Company. This involves an increase in cost at present rates of about 8s. per ton. Intimation of the new price will be made as soon as the decision of the Board of Trade has been received.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Sept.* 29.

The London pitch market remains strong, and business is offered at over 75s. net per ton *ex* makers' works. It is to be hoped that the high rates of exchange between this country and France and Belgium will be materially lowered soon, as business is undoubtedly being lost to the United Kingdom for this reason. Creosote is worth about 6d. net per gallon. Motor benzol is, of course, in great demand at this juncture. Other products, including sulphate of ammonia, are without change.

Tar Products in the Provinces.

Sept. 29.

The average values for gas-works products during the week were: Gas-works coal tar, 37s. 3d. to 42s. 3d. Pitch, East Coast, 66s. to 67s. 6d. per ton f.a.s.; West Coast—Manchester, 55s. to 57s. 6d.; Liverpool, 55s. to 57s. 6d., Clyde, 65s. to 70s. nominal. Benzol 90 p.ct., North, 1s. 8d. to 1s. 10d.; crude 65 p.c. at 120° C., 11½d. to 1s. 0½d. naked at makers' works; 50-90 p.ct. naked, North, 1s. 8d. to 1s. 10d. Toluol, naked, North, 2s. to 2s. 1d. nominal. Coal tar crude naphtha in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 2s. to 2s. 2d. Heavy naphtha, North, 2s. 1d. to 2s. 3d. Creosote, in bulk, North, liquid, 5d. to 5¼d.; salty, 4¾d. to 4⅞d. Heavy oils, in bulk, North, 6d. to 6¼d. Carbolic acid, 60 p.ct., 1s. 6d. to 1s. 6½d. Naphthalene, £15 to £17 10s.; salts, £4 10s. to £6, bags included. Anthracene, "A" quality, 7¼d. to 7½d. per minimum 40 p.ct.; "B" quality nominal.

FROM A MARKET CORRESPONDENT.

Tar Products.

The market is not very active, and prospects are not particularly promising in view of the coming reintroduction of a licensing system for export trade in several lines. The output has fallen off again recently—coal deliveries, particularly in northern districts, being lower on account of production having declined instead of continued to improve as promised. And the railway strike does not improve matters. Pitch is very firm everywhere; and although Provincial rates are without change, London quotes a trifle higher. In South Wales there are plenty of inquiries; but offers are not attractive enough for business to be completed. The French exchange is causing anxiety, as there were rumours that the French Government were to stop the import of pitch and other things, so as to improve the exchange. There is no official information, however, at the time of writing. Naphthalenes are without much change. There is a fair demand for refined; but makers of crude state that current rates would not pay them to produce. They claim that, compared with other bye-product prices, there is room for considerable improvement. Creosote remains firm. But the market in carbolic acids has gone to pieces again; and it is difficult to say exactly where matters stand. There are, at any rate, very few signs of business, and makers of crystals are only offering 1s. 7d. per gallon for crude 60's. Cresylic acids and crude tars are without change. Solvent naphtha is in request at advancing quotations. Supplies are not plentiful, especially in the North, and it will be some time before the effects of the recent strike in Yorkshire are eliminated. Benzol also is scarcer, owing to reduced output. In many instances makers are in arrear with deliveries. Toluol is steady; and other products are unchanged.

USE Simmance's

DEAD BEAT INDICATORS

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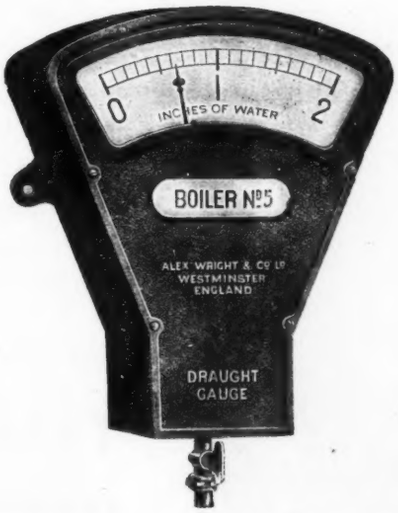
"READ THE PRESSURE BY THE POINTER."

No liquid to evaporate and no levels to adjust.

No glasses to break and nothing to clean.



Direct reading, Open scale, Any range (Pressure, Vacuum, or Combination).

Incorrodible, Accurate, for foul or purified gas.

MADE IN MANY RANGES WITH TABLETS LETTERED AS DESIRED.

ALEXANDER WRIGHT & CO., LTD., WESTMINSTER.

Agents: Australia—FYVIE & STEWART, 360, Collins St., Melbourne; Canada—W. P. ROPER, 502, Merchants' Bank Building, Montreal.

The range of quotations is as follows:

Benzol: 90% London 2s. to 2s. 2d., North 1s. 11d. to 2s.; 50-90% 1s. 9d. to 2s. London, 1s. 9½d. North; crude, 60-65% 1s. 5d. to 1s. 7d.; pure, 3s. per gallon naked.

Carbolic Acid: Crude 60's 1s. 8d. per gallon nominal; crystals, 40%, 7½d. per lb. asked.

Crude Tar: London, 47s. to 50s.; Midlands, 44s. to 46s.; North, 44s. 6d. per ton *ex* works.

Pitch: London, 77s. 6d. to 82s. 6d. per ton; East Coast, 70s. to 75s. per ton; West Coast, 67s. 6d. to 72s. 6d., with Manchester 70s. per ton and Glasgow 72s. per ton; South Wales, 64s. to 68s. per ton.

Solvent Naphtha: London, 2s. 5d. Provinces average 2s. 3d. per gallon.

Crude Naphtha: Naked, 10d. per gallon.

Heavy Naphtha: 2s. 5d. per gallon.

Naphthalene: Refined, £16 to £18 per ton nominal; crude, £5 10s. to £11, according to quality.

Toluol: Naked, 2s. 9d. per gallon nominal. North, 2s. 7d.

Creosote: London, 7¼d.; North, 5¾d. to 6¼d.; heavy oil, 6d. per gallon in bulk.

Anthracene: 40-45%, 7d. to 7½d. per unit per cwt.

Grease Oils: 18° Tw. (naked), £6 10s. per ton f.o.r. makers' works.

Aniline Oil: 1s. 2d. per lb.

Cresylic Acid: 95%, 2s. 4d. to 2s. 5d.; 97-99%, 2s. 7d. to 2s. 8d. *ex* works London, f.o.b. other ports.

Sulphate of Ammonia.

The position of sulphate remains unchanged. Supplies are short; and in view of the coal situation and the railway strike, there are no signs of any improvement for a long time to come. The demand for home uses is still very extensive; but several export engagements have been arranged by the Association, and fairly large quantities have again been sent away to Japan during this month, at values of from £23 to £26 per ton.

The South African Carbide and Bye-Products Company, Ltd., has been formed, with a capital of £307,500, for the purpose of manufacturing calcium carbide and of extracting motor spirit, tar oil, and other bye-products from coal and shale at Ballengeich Collieries, Natal. The Company will also manufacture sulphate of ammonia.

The success of the three days' conference of employers and employed, recently held in Birmingham by the Industrial League, has encouraged them to extend their operations. Arrangements have been made to hold similar conferences in Glasgow, Newcastle, Manchester, Bristol, Portsmouth, and Sheffield; and negotiations are being conducted in other places. Subjects relating to labour and commerce in all its various forms will be considered.

Padiham Gas-Works Report.

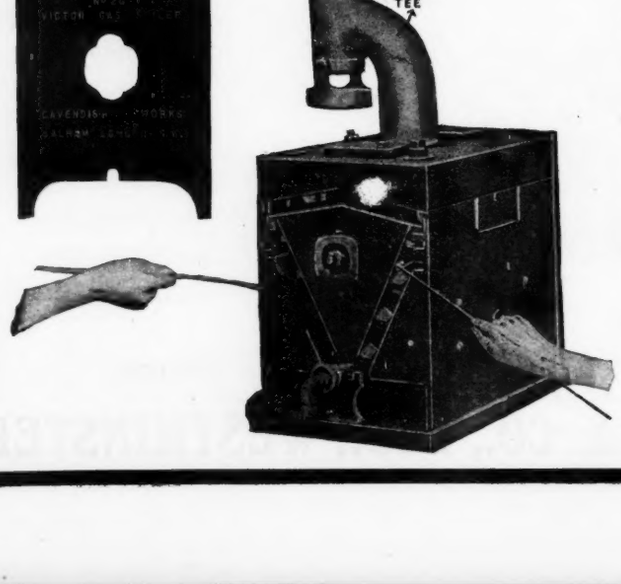
Reporting on the working of the gas undertaking of the Padiham Urban District Council for the year ended March 31 (during the last five months of which he was in charge), Mr. A. F. Ames, the Manager, states that the decrease in the quantity of gas sold, as compared with the previous year, was 6·74 p.ct. The falling-off was accounted for by the disuse of gas for munitions purposes. This represented a decrease of 8·07 p.ct.; so that gas sold in the ordinary way increased by 1·33 p.ct. The production of gas per ton of coal was the highest yet recorded—12,467 c.ft., being an increase of 421 c.ft. over the previous year. The sales of gas per ton of coal also show an increase of 313 c.ft. It is anticipated these results will be materially improved upon during the present year, as the vertical retorts are now working very satisfactorily. The unaccounted-for gas increased from 2·69 to 4·02 p.ct. This increase was almost wholly accounted for by serious leakages on the high-pressure main to Sabden, due to the slipping of the river bank. A commencement has been made to relay a section of the main; and this will remedy the trouble. The gas has averaged 520 to 550 B.Th.U. gross. A large percentage of the complaints received during the year were found to be due to inefficient appliances, and more particularly to the small services, the majority of which are ½ in. These are totally inadequate where heating and cooking appliances are installed. The gross profit on the year's working was £2191; and the deduction of loan and interest charges left a deficit of £2097. Mr. Ames says that, considering the losses the previous year, and the increased expenditure to be met, with a prospect of reduced consumption, there does not appear to have been sufficient provision made when increasing the price of gas.

Forging a Testimonial.—Pleading not guilty to the charge, a fitter named Ward was, at West Ham, sent for trial at the Central Criminal Court for fraudulently making a false document with intent to deceive. For a short time he was in the service of the Gas Light and Coke Company at their Bromley works, and the offence alleged against him was that, using the Company's note headings, he had forged a testimonial purporting to have been written and signed by John Henry Methven, the Resident Engineer at Bromley, and sent this to the Brentford Gas Company for the purpose of getting a situation.

Manchester Street Lighting.—At a meeting held last Thursday of the Manchester Watch Committee, the question of street lighting was discussed. The matter was raised in consequence of a letter from the Gas Committee stating that they were unable to carry out the request of the Watch Committee to provide street lighting on a pre-war scale. This was due to the fact that the Finance Committee had cut-down the estimates for street lighting. The Watch Committee were not satisfied, and decided to appoint a Sub-Committee to meet both the Gas and Finance Committees, with a view to getting pre-war lighting reinstated. It was necessary, they said, because of the numerous complaints.

GAS HEATED HOT WATER SUPPLY
BOILER MAINTENANCE

The simplicity of the cleaning arrangements of all our products is an outstanding feature in their design. VICTOR Boilers produce "high-temperature" water which is necessary for successful hot-water supply, and adequate provision giving access to both water ways and flues is provided. It is only by this means and regular attention being accorded, that any boiler can be maintained at full efficiency.



THOMAS POTTERTON,

Cavendish Works, Balham,

——London, S.W. 12.——

Telephone: - - Streatham 2052-3.
Telegrams: - - "Potterton, London."

Ennis Gas Company's Affairs.—At a public meeting in Ennis (co. Clare), it was decided to make an offer to the Court, in respect of the local Gas Company, now being wound up. A new company is to be formed, with a capital of £3500.

Gas and Electricity at Hastings.—At the last meeting of the Hastings Town Council one of the members asked the Town Clerk: (1) How many street gas lights had to remain unlighted in consequence of the war? (2) For how long did they remain unlighted? (3) What has been the exact saving to the Council in pounds, shillings, and pence as a result of this arrangement? The replies were as follows: 1 and 2. From Aug. 1, 1914, to April 9, 1916, partial lighting obtained. From April 16, 1916, to Nov. 11, 1918, about 660 gas-lamps remained unlighted. 3, Allowing for the increase in the price of gas, the saving effected during the period from Aug. 4, 1914, to Dec. 31, 1918, was approximately £7930. Subsequently, the Town Clerk reported that he had received from the Board of Trade a formal order stipulating that the price of electricity shall not exceed 10d. per unit except by variation from the Board, nor be more than sufficient "to enable the undertaking to be carried on without loss."

Lamplighters' Pay at Bury.—The Municipal Employees Association have made application to the Bury Corporation Lighting Committee on behalf of the lamplighters, for such an increase in wages as would give them not less than £2 a week for cleaning and lighting, or, as an alternative, that full-time work be found for them. The Committee decided that the Association should be allowed to send a deputation to the next meeting, if desired, to discuss the matter.

Wages at Rochdale.—The Gas and Electricity Committee of the Rochdale Corporation have had before them an application from the General Workers' Union for an immediate advance in the wages of their members of 10s. a week. In view of the fact that the application had already been declined by the National Association of Gas Employers, the Committee took no action upon it. An application was also received from the meter inspectors for such an increase as would bring their wages up to £3 10s. a week; and they asked for fourteen days' holiday with pay annually, the provision of uniform, and other concessions. The Committee were requested to receive a deputation on the subject; and it was decided that the Works and Sub-Committee should hear the men's representatives.

STOCK MARKET REPORT.

THE Stock Exchange has had another dull week, and business has been persistently perturbed by various sources of anxiety. First and foremost came the threatened railway strike, which brooded heavily over markets, although from time to time an occasional glimmer of hope was perceptible. Then, the prospect of dearer money was still a disturbing element. To add to the adverse factor, the Jewish New Year's festival seriously depleted the attendance of members. In these circumstances, the all-round tendency was naturally very flat.

The gilt-edged section was irregular, keeping in step with movements in the Money Market. Home Government issues in general were lower at the close. The 5 p.ct. Loan touched 94⅜, and Consols 50⅜ on Friday; and the Funding Loan changed hands at 76⅜, and the Victory Bonds at 83¾. Very little was done in Home Rails; prices being cautiously put down. Good support was given to Argentines. In the Foreign Market, French continued the smart rally initiated the week before, and Russians attracted notice; but Japanese relapsed. Among the Miscellaneous group, there was nothing very remarkable. Rubber was rather better towards the close; but Oil moved irregularly. Shipping and Breweries found many friends.

Business in the Gas Market showed some improvement in point of activity over the dead-calm of the week before; but no remarkable feature was developed. The tendency on the whole was fairly firm; most of the issues dealt in adhering pretty closely to their prices of the preceding week, and changes of quotation being rare in number and mostly *ex div.* variations. The Metropolitan companies were unchanged. In Provincials, Newcastle was quoted rather easier. Imperial Continental receded, with a mark of 124 on Friday; and the quotation was lowered 4 points.

Bargains done for cash during the week were as follows: On Monday, Commercial 4 p.ct. 58, Gas Light ordinary 60, ditto debenture 52⅜, Imperial Continental 127, 128½, Primitive 32s. 6d., 33s. 9d., 34s., ditto preference 66s. 3d., 67s. 6d., South Metropolitan, 60¼, 60½, 61, ditto preference 95½, Mid Kent 21s. On Tuesday, Alliance and Dublin 45, Bombay 5⅜, Bournemouth preference 9⅜, European 12, 12¼, 12 3/16, Gas Light ordinary 59½, 60, 61, ditto debenture, 53¾, Monte Video 13, Primitiva 32s. 6d., 34s. 6d., ditto preference 66s. 3d., ditto debenture 72, South Metropolitan 60, 61. On Wednesday, Alliance and Dublin 50, Bombay 5⅞, Bournemouth preference, 9 7/16, Commercial 4 p.ct. 55, European 12 3/16, Gas Light ordinary 59½, 59⅝, 60, 60¼, 60½, Imperial Continental 127, 128½, Monte Video 13¼, Primitiva 31s. 3d., 35s., ditto preference 66s. 3d., 67s. 6d., South Metropolitan 60, 61. On Thursday, Bournemouth "B" 10¼, 10⅜, 10 11/16, British 25½, Commercial 4 p.ct. 56, Imperial Continental 125, 125⅛, 126, 127, Primitiva 33s. 9d., 33s. 9¾d., ditto preference 66s. 3d., ditto debenture 72½, South Metropolitan 60, ditto preference 94½. On Friday, Commercial 4 p.ct. 55½, Gas Light ordinary 59, 60, 60½, Imperial Continental 124, 125, Monte Video 13, Primitiva preference 66s. 3d., 67s. 6d., 68s. 9d., San Paulo 7 13/16, South Metropolitan 60.

The Money Market was very variable, opening with a good demand, which relaxed next day and led to a condition of marked ease. This, in its turn, gave way, and the close was firm. Discount rates followed a similar course. The Bank rate is 5 p.ct., as fixed on April 5, 1917.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Share	When ex-Dividend	Ante-War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices at Bargains.
193,049	Stk	July 31	4	4⅜	Aldershot 4 p.c. Pref.	..	60—65	..
1,551,868	"	Sept. 26	2½	2⅜	Alliance & Dublin Ord.	59—64	43—48*	45—50
374,000	"	July 11	4	4⅜	Do. 4 p.c. Deb.	76—79	60—62	..
280,000	5	April 29	7½	8⅜	Bombay, Ltd.	5¼—5⅝	5⅜—6⅛	5⅜—5⅞
50,000	10	Aug. 28	16	12½	Bournemouth Gas and Water { 10 p.c.	29—30	19—20	..
888,110	10	"	7	7⅜	B 7 p.c.	15—16½	10—11	10¼—10 1/16
116,000	10	"	6	6⅛	Pref. 6 p.c.	13¼—14	9 1/16—9⅜	9⅛—9 7/16
159,740	—	June 27	—	4⅜	4 p.c. Deb.	..	65—67	..
992,045	Stk.	July 11	14	87/-	Brentford A Consolid.	251—266	55—60	..
784,920	"	"	11	31/8	Do. B New	204—209	50—55	..
55,000	"	"	5	5⅜	Do. 5 p.c. Pref.	109—111	76—78	..
221,400	"	June 11	4	4⅜	Do. 4 p.c. Deb.	91—93	64—66	..
214,775	"	Sept. 11	11	7½⅜	Brighton & Hove Orig.	208—218	123—128	..
344,300	"	"	8	6½⅜	Do. A Ord. Stk.	154—159	84—89	..
283,500	Stk.	—	5	5⅜	Bristol 5 p.c. max.	..	..	..
590,000	20	Sept. 26	12½	10⅜	British	44—45	25—27*	25½
120,000	Stk.	June 27	4	4⅜	Do. 4 p.c. Deb. Stk.	88—90	63—65	..
245,771	"	"	4	4⅜	Buenos Aires 4 p.c. Deb.	85—87	50—53	..
100,000	10	—	—	—	CapeTown & Dis., Ltd.	1½—2½	6¾—7	..
100,000	10	—	—	4⅜	Do. 4½ p.c. Pref.	4—6	6½—7½	..
100,000	Stk.	June 27	4½	4⅜	Do. 4½ p.c. Deb. Stk.	70—76	61—66	..
157,150	"	Feb. 26	5	5⅜	Chester 5 p.c. Ord.	108—110	..	..
1,518,380	"	Aug. 14	5/9/4	80/-	Commercial 4 p.c. Stk.	106—108	55—60	55—58
660,000	"	"	5½	26/8	Do. 8½ p.c. do.	108—105	54—57	..
475,000	"	June 11	8	8⅜	Do. 3 p.c. Deb. Stk.	69½—71½	50—52	..
800,000	"	"	4	—	Continental Union Ltd.	76—79	43—48	..
200,000	"	"	7	—	Do. 7 p.c. Pref.	115—118	66—70	..
51,600	Stk.	Aug. 28	14½	12⅜	Croydon A 10 p.c.	..	150—160	..
278,400	"	"	11½	9⅜	Croydon B and C 7 p.c.	..	105—115	..
492,270	Stk.	—	6	6¼⅜	Derby Con. Stk.	128—125	..	..
55,000	"	—	4	4⅜	Do. Deb. Stk.	102—104	..	..
1,002,180	10	July 30	10	5/0	European, Ltd.	17½—18	12—14	12—12 9/16
16,298,975	Stk.	"	4/17/4	80/-	Gas Light and Coke { 4 p.c. Ord.	98—102	58—61	59—61
3,600,000	"	"	8½	26/8	8½ p.c. max.	76—79	47—49	..
4,062,285	"	"	4	4⅜	4 p.c. Con. Pref.	96—99	65—68	..
4,874,850	"	June 11	8	8⅜	3 p.c. Con. Deb.	72½—74½	52—55	52½—53½
180,000	"	"	10	10⅜	10 p.c. Bonds	..	..	..
82,500	"	Sept. 11	5	4½⅜	Hastings & St. L. 5 p.c.	..	57—62	..
258,740	"	"	3½	2⅜⅜	Do. 3½ p.c	37—39	42—47	..
70,000	10	April 29	11	7⅜	Hongkong & China, Ltd.	16½—15½	12—13	..
86,600	Stk.	Aug. 28	9	8½⅜	Hornsey 7 p.c.	..	110—115	..
181,000	"	Sept. 11	7½	5⅜⅜	Ilford A and C.	151—154	88—93	..
65,780	"	"	6¾	4½⅜	Do. B	115—118	67—72	..
65,500	"	June 27	4	4⅜	Do. 4 p.c. Deb.	92—94	61—64	..
4,940,000	"	May 14	9	4½⅜	Imperial Continental	150—160	124—129	124—128½
1,235,000	"	Aug. 14	8½	8⅜⅜	Do. 8½ p.c. Deb. Red.	84—86	79—81	..
235,942	"	Sept. 11	6¾	8⅜⅜	Lea Bridge Ord. 5 p.c.	119—121	87—92	..
2,498,986	"	Feb. 26	10	42/6	Liverpool 5 p.c. Ord. { A / B	211—213 / 146—148	..	..
806,088	"	June 26	4	4⅜	Do 4 p.c. Pr. Deb. Stk.	..	..	..
165,736	"	Aug. 14	7/5/8	83⅜	Maidstone 5 p.c.	..	56—61	..
75,000	5	June 11	6	8⅜	Malta & Mediterranean Mes. of Melbourne { 4½ p.c. Deb.	4¼—4⅝	3½—3⅞	..
250,000	100	April 1	4½	4½⅜		99—101	91—98	..
541,920	20	May 29	4	5⅜	Monte Video, Ltd.	11½—12	12½—13½	13—13½
1,575,892	Stk.	July 30	4½	8⅜⅜	Newcastle&Gateah'dCon.	98½—99½	63½—68½	..
522,705	"	June 27	8½	8⅜⅜	Do. 8½ p.c. Deb.	82—88	57—58	..
15,000	10	Sept. 11	—	11⅜	North Middlesex 10 p.c.	..	13½—13⅞	..
56,940	10	"	7/14/0	7⅜⅜	" " 7 p.c.	14—15	9—9½	..
800,000	Stk.	May 14	8	8⅜	Oriental, Ltd.	117—122	103—106	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7¾	4⅞—5½	..
60,000	50	Aug. 28	13	7⅛⅜	Portsea, Island B	128—131	74—76	..
100,000	50	"	12	6⅞⅜	Do. C	118—121	66—68	..
349,980	5	April 29	8	—	Primitiva Ord.	5¼—6	1½—2	31/3—34/6
499,960	5	June 26	5	—	Do. 5 p.c. Pref.	4¾—5	3½—3⅞	66/3—68/9
521,600	100	June 9	4	4⅜	Do. 4 p.c. Deb.	91—93	71—73	72—72½
600,000	Stk.	July 30	4	4⅜	Do. " " 1911	..	49—52	..
846,198	"	June 27	4	4⅜	River Plate 4 p.c. Deb.	85—87	49—52	..
150,000	10	Sept. 26	6	6/-	San Paulo { 6 p.c. Pref.	10¾—11	7⅛—8*	7 13/16
125,000	50	July 2	5	5⅜	5 p.c. Deb.	47—49	40—42	..
185,000	Stk.	Aug. 28	10	5⅜	Sheffield A	223—224	81—86	..
209,984	"	"	10	5⅜	Do. B	223—224	81—85	..
528,500	"	"	10	4⅜⅜	Do. C	220—222	70—72	..
133,201	Stk.	Sept. 12	4	4⅜	Shrewsbury 5 p.c.	..	..	..
90,000	10	June 27	9	10⅜	South African.	10½—11½	12½—13½	..
8,609,595	Stk.	Aug. 14	5/4/0	80/-	South Met. 4 p.c. Ord.	111—113	59—62	60—61
250,000	"	July 11	—	5⅜	Do. Pref.	..	94—96	94½—95½
1,895,445	"	"	8	8⅜	Do. 3 p.c. Deb.	73½—74½	52—54	..
224,820	"	Aug. 14	8½	5⅜	South Shields Con. Stk.	157—159	104—106	..
952,795	"	"	6	3⅜⅜	S'th Suburb'n Ord. 5 p.c.	114—116	68—73	..
187,568	Stk.	June 27	5	5⅜	Do. 5 p.c. Deb. Stk.	116—118	88—91	..
647,740	"	May 14	7½	8⅜	Southampton Ord.	99—102	68—68	..
121,375	"	June 27	4	4⅜	Do. 4 p.c. Deb. Stk.	..	63—65	..
130,000	"	Aug. 14	—	4½⅜	Tottenham District { A 5 p.c.	185—188	70—75	..
782,375	"	"	6	3⅜	B 5½ p.c.	115—117	50—55	..
181,265	"	June 26	4	4⅜	4 p.c. Deb.	87—89	54—56	..
182,880	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5⅜	Do. 5 p.c. Deb. Red.	93—95	45—50	..
286,476	Stk.	Sept. 11	5	5⅜	Tynemouth 5 p.c. max.	108½—109	80½—82½	..
80,000	"	Aug. 28	8⅜	55/-	Wandsworth, Wimbledon, and Epsom—			
255,696	"	"	6⅜	40/-	Wandsworth A 5 p.c.	131—135	85—90	..
108,075	"	"	—	38/6	Do. B 5½ p.c.	129—134	63—68	..
140,865	"	"	—	38/6	Do. C	..	63—68	..
363,000	"	"	6½	39/9	New Ordinary	..	63—68	..
98,000	"	"	6⅜	40/-	Wimbledon 5 p.c.	117—122	65—70	..
85,416	..	June 27	3	3⅜⅜	Epsom 5 p.c.	121—126	65—70	..
					3 p.c. Deb. Stk.	56—59	49—51	..

* Ex Div.

Lamps Before and After the War.

The increased cost of street-lamps is indicated by the Chief Inspector of the Brentford Gas Company, who informs the Heston and Isleworth Urban District Council that, owing to the heavily increased cost of carrying out the work, the Company are compelled to consider the question of revising the prices charged for the public street-lamps. He states that the price now paid does not nearly cover the cost. Both labour and material have risen more than 100 p.ct. above 1914 prices; and the state of affairs in regard to these two factors is in such a fluid state at present that the Company do not desire to enter into any permanent contract as to the price to be charged in future, but to come to some arrangement with the Council for an increase on a fair basis dating from Michaelmas next, to be subject to revision (say) at the end of six months. The Company have, during the war, made allowances to the Council amounting to the sum of £2702. The prices proposed to be charged are: For lamps now at £3 11s. 5d., £5 15s. 11d. per annum; and for lamps now at £6 1s. 10d., £10 4s. 3d. per annum. The prices quoted, he adds, are only sufficient to cover the bare cost of the service, and include gas based upon the price charged to the Council when gas is supplied to the public at 4s. per 1000 c.ft. Any variation in the Company's price would call for revision of the prices now quoted. The Council are considering the question of expecting economies in the matter of street lighting.

Truro Gas Company.

At the annual meeting of the Company, the Directors reported that working costs showed considerable increases; but owing to improved methods of manufacture, the profit earned on the year was slightly higher To meet the recent increase of 6s. per ton in the price of coal, the Directors had been obliged to again advance the charge for gas by 6d. per 1000 c.ft. The dividend recommended on the ordinary stock was at the rate of 2½ p.ct. per annum—the maximum allowed under the sliding-scale. The carry-forward would amount to £1321. The Chairman (Mr. John James) pointed out that the position financially would have been less favourable, but for the fact that by improved working with the vertical retort plant, a further saving of 400 tons of coal had been effected during the year. Mr. S. J. Ingram (the Engineer and Manager), responding to a vote of thanks, said it seemed more than passing strange that in a commercial utility undertaking only a modest return of 2½ p.ct. should be permitted. There were, however, prospects of a Bill being brought forward in Parliament which would apply to the whole of the gas industry, and which would give them some additional relief. He believed the Bill would embrace provisions enabling gas companies, at any rate, to pay dividends equal to those that they paid in pre-war days. Though labour unrest had given considerable trouble in other parts of the country, in Truro they had had little to complain of. The Directors had realized that, with the increased cost of living, the wages of the employees should be increased. When the national award was made to the gas employees throughout the country, the Truro employees quite voluntarily waived their claim to it, because they recognized that the industry had been badly hit by the war, and that the Directors had always met them fairly in respect of wages. The public of Truro, as well as the Directors, should appreciate this act on the part of the employees.

A Modified Increase at Rhyl.—When a recommendation of the Gas Committee that the price of gas be increased from 3s. 11d. to 4s. 8d. per 1000 c.ft. came before the Rhyl Council, it was maintained by the Chairman of the Finance Committee that there was no justification for such an increase. The members of the Committee favoured the larger sum because of the uncertainty of the present position; but the officials thought 4s. 6d. would be amply sufficient, if there was no great increase in expenditure. By a large majority, the Council decided not to make the increase more than to 4s. 6d.

Stove and Meter Rents at Hull.—Replying to protests evoked by the decision of the British Gas Light Company at Hull to raise their stove and meter rents 50 p.ct., concomitant with a further rise from 4s. to 4s. 6d. per 1000 c.ft. in the price of gas, Mr. H. E. Copp, the newly-appointed Engineer and Manager at the Hull station, says that what the public overlook is that the 50 p.ct. extra which the Company now propose to charge is not only the amount allowed by Act of Parliament, but they might have charged it all along. Many years ago, at a time when the price of gas was very low, the Directors, instead of still further reducing the charge, decreased the meter-rents by 1s.; and this has been maintained up to the present. That the consumer had been favoured, he said, was shown by the fact that the East Hull Gas Company always charged the full meter-rent allowed by their Act. The justification of the British Company for re-imposing the extra rent now was because the cost of meter maintenance and of meters has gone up nearly 200 p.ct. A meter sent up for examination to-day cost as much as formerly they could have purchased a meter for.

Burnley and its Gas Supply.—Mr. W. Doig Gibb is the expert who has been engaged to report upon the Burnley Corporation's gas undertaking, in accordance with a recent resolution of the Town Council.

Dissatisfaction at Haddington.—Following upon an agitation for a rise of 10s. a week, most of the employees at the Haddington Gas-Works left their employment. The Company offered the men an advance of 9d. per day.

The Municipalization of the Gas Supply of Sunderland.—The Sunderland Trades Council and the Labour Party are pressing for the municipalization of the town's gas supply, and have appointed a deputation to the Town Council to advocate this step. It is proposed to make the matter a test-question at the November elections.

A Yorkshire Gas-Works Sold.—It is reported that the works of the Billingborough and Horbling Gas Company (in liquidation) have, after an unsuccessful attempt to sell them by auction, been purchased by a local Syndicate, "who intend running them for the convenience of the public. The fear of the town being in darkness during the ensuing winter is thus happily obviated."

Dundee and the Gas-Workers' Demands.—At a meeting last week of the Dundee Corporation Gas Committee, it was reported that the National Federation of General Workers had intimated that their claim for higher pay had been put forward quite seriously; and under the circumstances they had no power to withdraw it, as suggested by the National Federation of Gas Employers. The men asked that the claim should be referred for decision to the Joint Industrial Council. The employers, however, had repeated their opinion that the claim could not be entertained, and that no useful end would be served by the demand being referred to the Joint Industrial Council.

The Ministry of Health have given their sanction to the borrowing by the Bury Corporation of £4000 for prospective expenditure on gas-mains, and £6000 for gas heaters and cookers.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official List" for Sept. 24.]

Nos. 22,603—23,219.

BARRACLOUGH, A.—Gas-cookers. No. 22,955.
BEARD, G. F. H.—"Framing for supporting crowns of gasholders. No. 22,639.
BLAKELEY, H.—"Continuously-acting apparatus for breaking, screening, washing, and assorting coke, &c." No. 22,803.
BURDON, C. B.—"Valves, cocks, or taps." No. 22,645.
BURGOYNE, J. S.—"Purification of gas." No. 23,167.
CALVERT, G —"Manufacture of cyanide and cyanogen compounds." No. 23,211.
CREASEY, A. & J. W.—"Utensils for producing toast by gas-ring." &c. No. 22,952.
DEMPSTER, R. & J.—See Beard. No. 22,639.
EISNER, S.—"Means for controlling source of light." No. 23,107.
FIDDES, W. J.—"Apparatus for effecting regulation or checking flow of liquids or gases through pipes or ducts." No 23,186.
HEWETT, F.—"Heating apparatus using gas," &c. No. 22,626.
HOLT, C. E.—See Burgoyne. No. 23,167.
JOHNSTON. J.—"Rotary compressors and exhausters." No. 23,208.
PORTER, L.—"Lighting apparatus." No. 23,156.
RADET, L.—"Automatic apparatus for supplying gas to, and extinguishing, gas-lamps." No. 22 812.
RICHMOND Gas Stove & Meter Company.—"Domestic hot-water service systems." No. 23,172.
RINCKER, F. G. C.—"Gasification of solid fuel." No. 22,785.
ST. LEGER, A.—See Richmond. No. 23,172.
SCOTT, J. W.—See Beard. No. 22,639.
SHAW, E. J. A.—See Blakeley. No. 22,803.
STEVENS, R. H.—"Mantles for gas lighting by incandescence." No. 23,154.
STROUD, A. H.—See Fiddes. No. 23,186.
WELLS. J.—"Grates for gas-producers and carbonizing plants." No. 23,086.
WILSON, W. G.—See Burdon. No. 22,645.

Restoration of Lapsed Patent.

An order has been made restoring the letters patent granted to WILLIAM BARNHART BASTIAN for an invention entitled "Improvements in gas-water heaters." No. 22,061 of 1913; dated Sept. 30, 1912.

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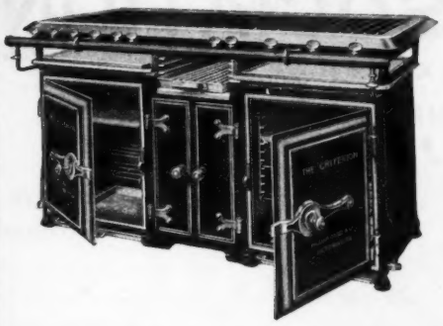

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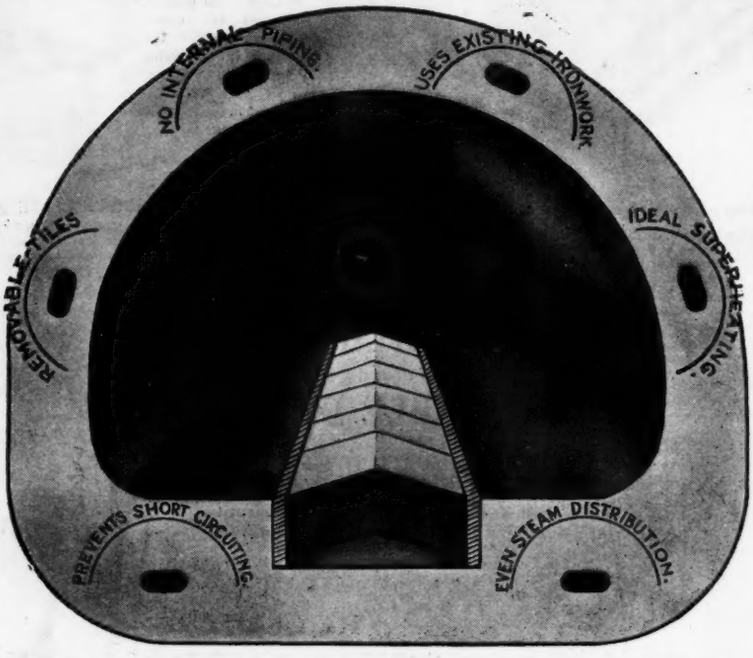

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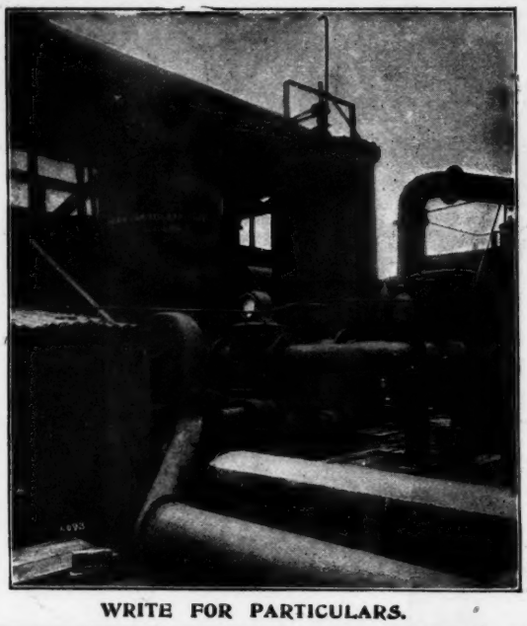

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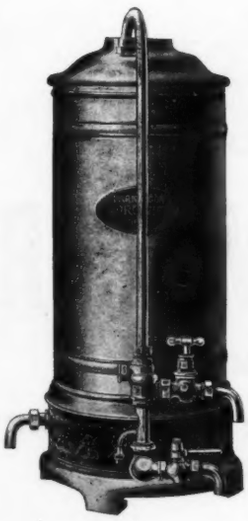

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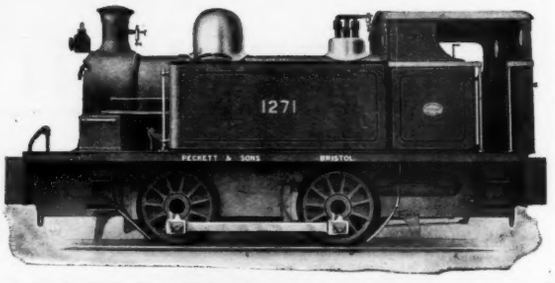

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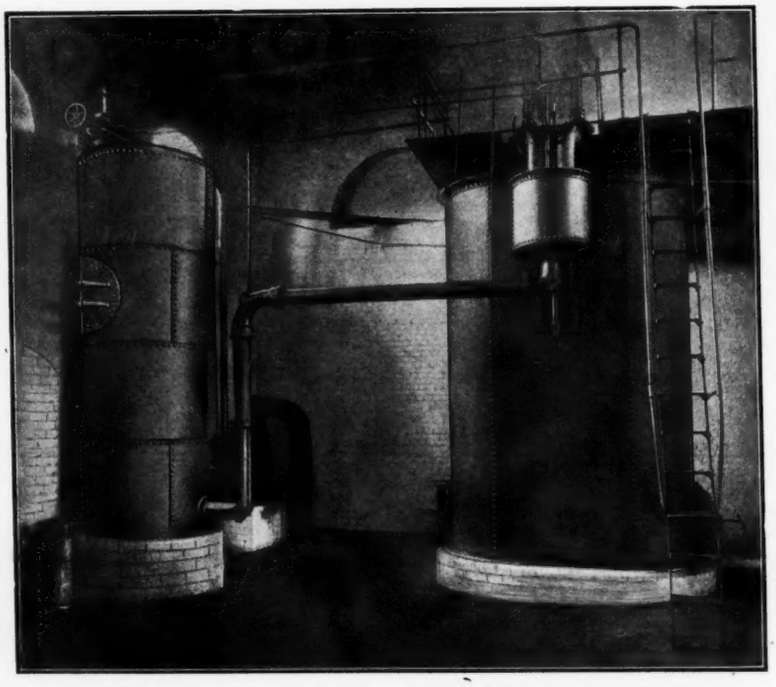

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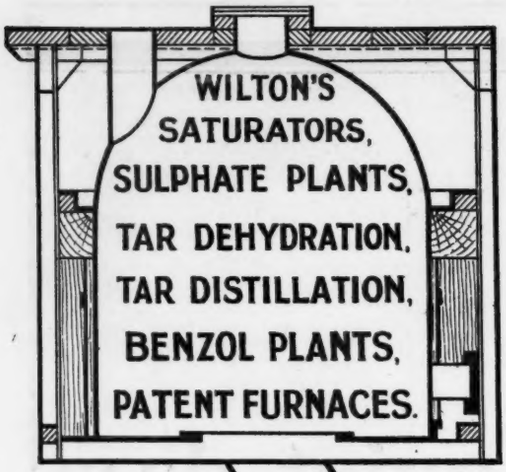

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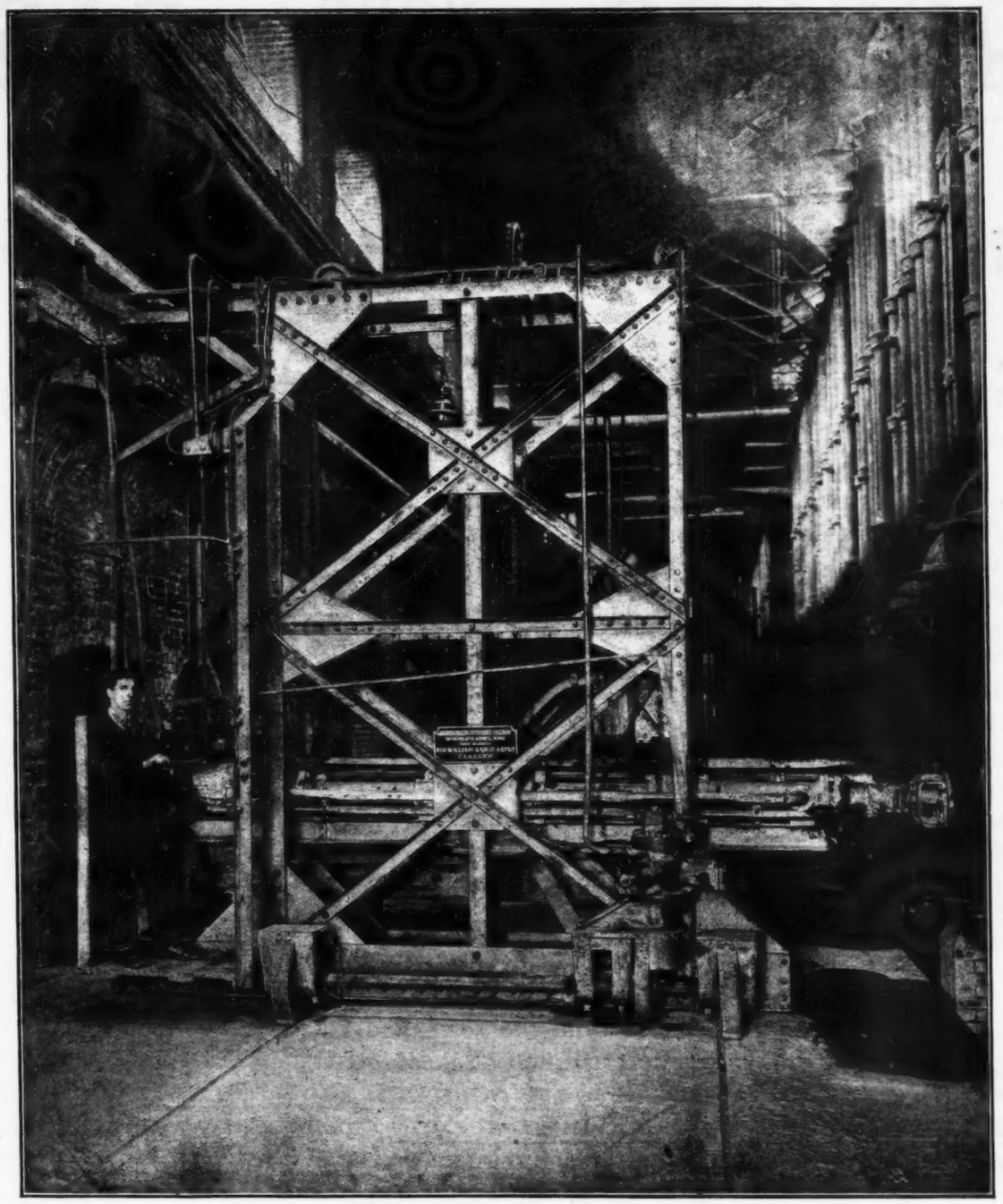

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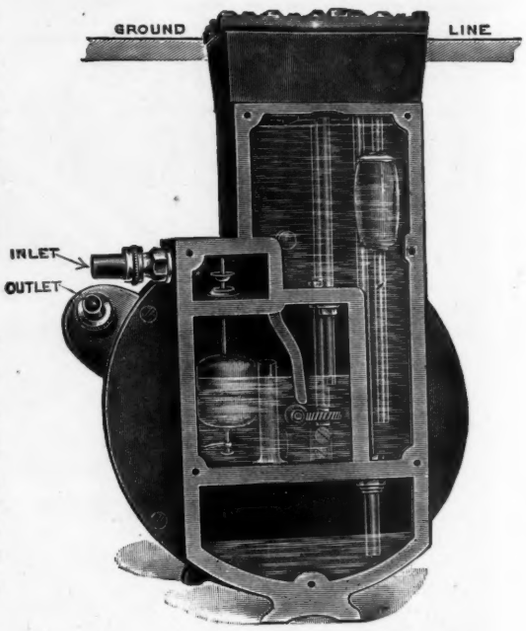


Apart from lamps, however, it specially commends itself for ordinary purposes. For instance, in a residential district, where a mansion-house or public institution may be situated at some distance from the road, and connected to the main by a long, and possibly leaky, service pipe, one of these Meters, placed in the footpath, close to the entrance gate, would act as **an important factor in the reduction of the percentage of unaccounted-for gas,** and be readily accessible to the Meter inspector at any time without entering the house at all.

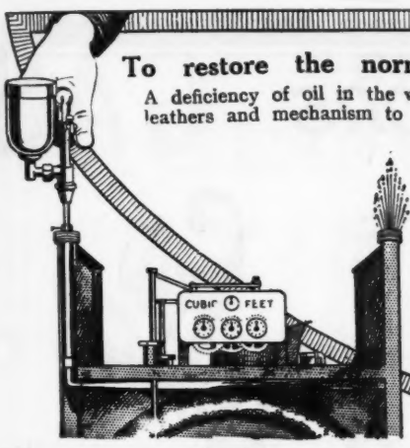
This advantage recommends itself for public works as well.

Even for ordinary house property along the street line, the adoption of this Meter would render the reading of the index possible at any time, even although the house is shut—no return visit required.

These Meters are all constructed on the fountain principle, and once filled they require no further attention for twelve months.

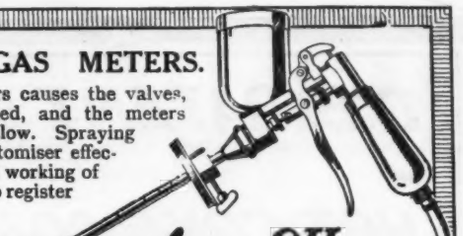
ALDER & MACKAY, LTD.

Gas Meter Makers, EDINBURGH.



To restore the normal working of GAS METERS.

A deficiency of oil in the working parts of Gas Meters causes the valves, leathers and mechanism to become fouled and corroded, and the meters consequently to register slow. Spraying with the Aerograph Oil Atomiser effectually restores the normal working of meters and causes them to register correctly.



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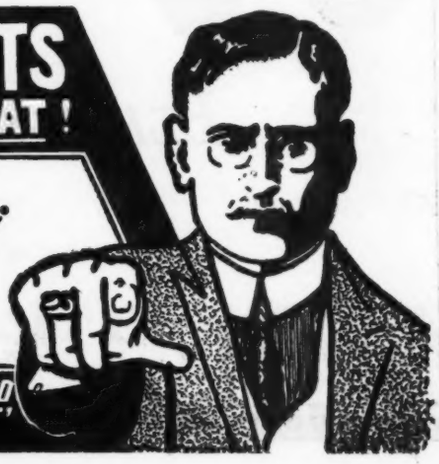

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	2nd „	4 „
	3rd „	4 „
Rochdale		1¼ „
Tokio		1¾ „
Lurgan		¼ „
Helensburgh		½ „
Sydney (N.S.W.)	1st installation	1¾ „
	2nd „	1¾ „
	3rd „	6 „
Bradford		2 „
Fitchburg (U.S.A.)	1st installation	¼ „
	2nd „	¼ „
Newcastle (N.S.W.)		1 „
Belfast	1st installation	2½ „
	2nd „	5½ „
Nelson	1st „	1¼ „
	2nd „	1¼ „
Blackpool	1st „	¾ „
	2nd „	¾ „
Stockholm (Sweden)		1½ „
Bergen (Norway)		¾ „
Newcastle-upon-Tyne	1st installation	2½ „
	2nd „	3 „
Heywood		½ „
Darlington		2 „
Oldham		2 „
Bridgwater		½ „
Southport		1¼ „
Cambuslang		½ „
Nottingham		1½ „
Tipton		½ „
Leicester	1st installation	2½ „
	Extension	1 „
	2nd installation	2 „
Exeter		1¼ „
Barnoldswick		½ „
Goteborg (Sweden)	1st installation	1 „
	2nd „	1½ „
Cape Town (South Africa)		½ „
Hong Kong (China)		¾ „
Berlin (Germany)		¼ „
Liverpool	1st installation	2½ „
	2nd „	2½ „

		Capacity in cubic feet per diem.
Macclesfield		1 million
Lytham		½ „
Dunoon		½ „
Pawtucket (U.S.A.)		1 „
Montreal (Canada)	1st installation	4 „
	2nd „	2 „
Ottawa (Canada)		1½ „
Grays and Tilbury		½ „
Bangor (Ireland)		½ „
Brisbane (Queensland)		1½ „
Northampton	1st installation	1¼ „
	2nd „	1¼ „
Cardiff	1st installation	2½ „
	2nd „	1¼ „
North Sydney (N.S.W.)		2½ „
Bothwell and Uddingston		¾ „
Springfield (U.S.A.)		1½ „
Preston		1¼ „
Portland (U.S.A.)		1 „
Santos (Brazil)		¾ „
Lea Bridge	1st installation	1 „
	Extension	½ „
Pernambuco (Brazil)		¾ „
Chorley		1¼ „
Swindon		½ „
Rochester		1¼ „
Rothesay		½ „
Napier (New Zealand)		½ „
Salford		1¼ „
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Rhymney and Aber Valleys		½ „
Holywood		¼ „
Blyth		1 „
Stafford		1 „
Zaandam (Holland)		¾ „
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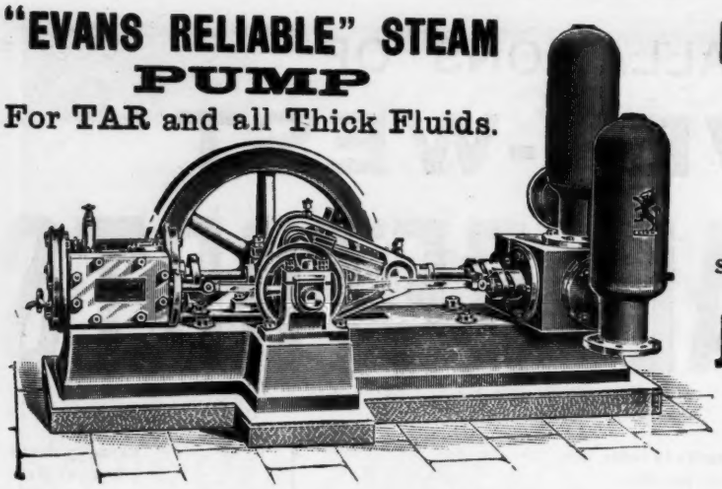

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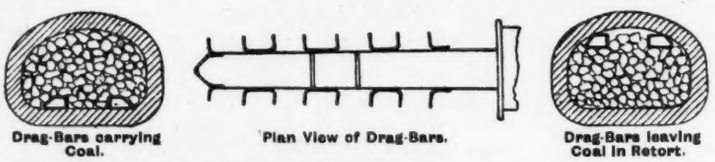

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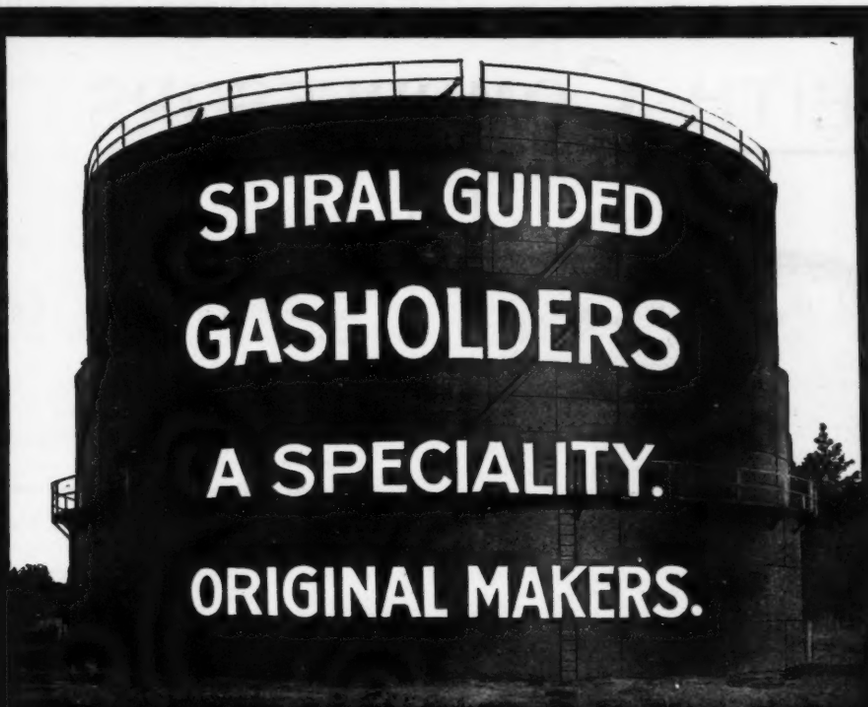

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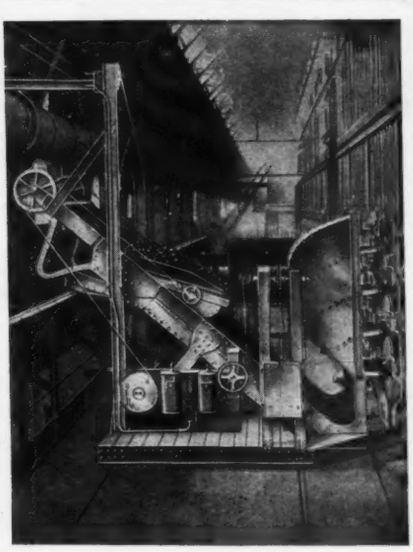

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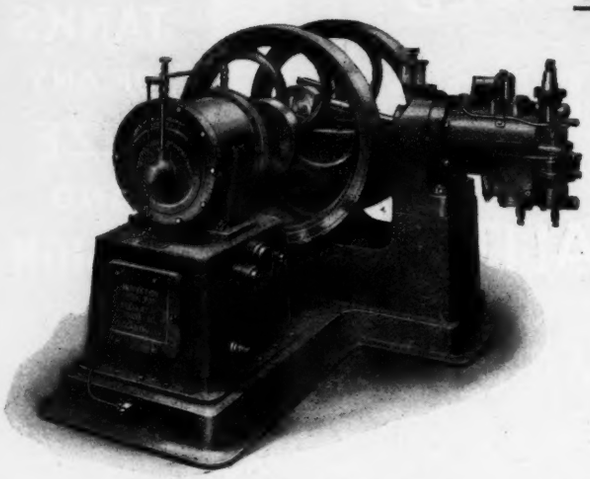

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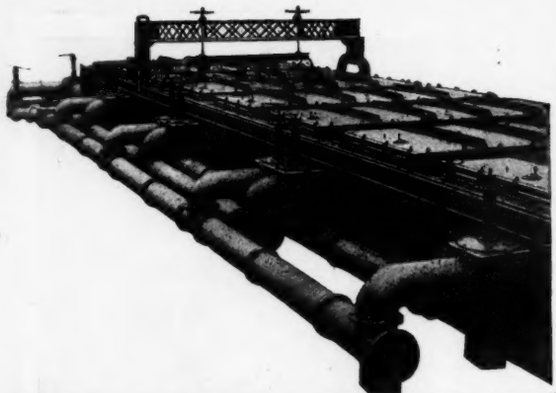

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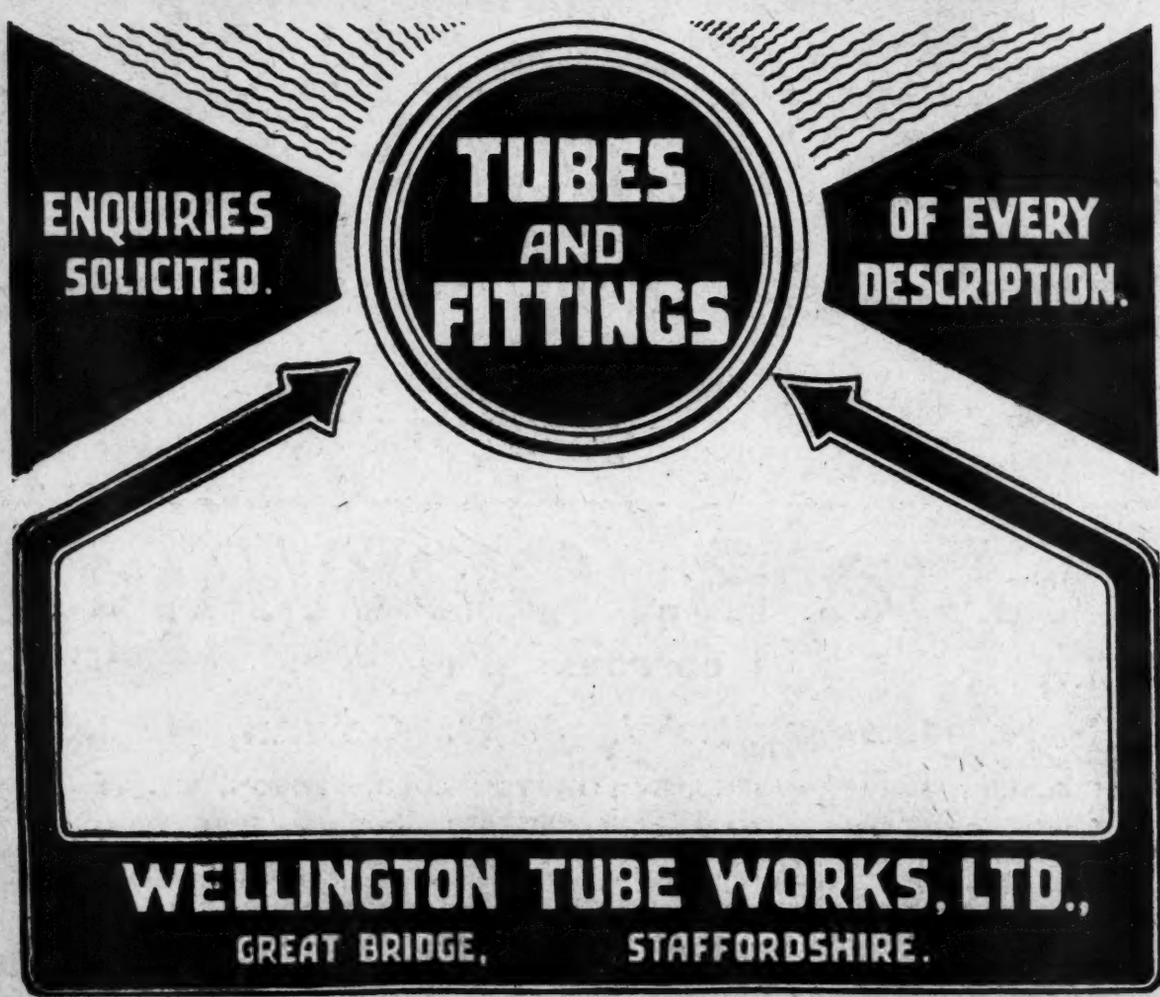

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